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UNITED STATES NATIONAL MUSEUM BULLETIN 280

A Revision of the Peoriinae and Anerastiinae (Auctorum) of America North of Mexico (Lepidoptera: Pyralidae)

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SMITHSONIAN INSTITUTION PRESS

WASHINGTON, D.C.

1968

Publications of the United States National Museum

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This work forms number 280 of the *Bulletin* series.

FRANK A. TAYLOR
Director, United States National Museum

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1968

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 20 cents

Contents

	Page
Introduction	1
Materials and Methods	2
Acknowledgments	4
Review of the Literature	5
Classification	6
Subfamily Peoriinae	8
Genus *Peoria* Ragonot	9
P. longipalpella (Ragonot)	13
P. bipartitella Ragonot	14
P. tetradella (Zeller)	16
P. opacella (Hulst)	18
P. floridella Shaffer	20
P. rostrella (Ragonot)	21
P. gemmatella (Hulst)	22
P. roseotinctella (Ragonot)	24
P. johnstoni Shaffer	26
P. santaritella (Dyar)	27
P. holoponerella (Dyar)	28
P. approximella (Walker)	29
P. luteicostella (Ragonot)	36
Genus *Anacostia* Shaffer	37
A. tribulella Shaffer	38
Genus *Arivaca* Shaffer	39
The Pimella Group	40
A. pimella (Dyar)	41
A. linella Shaffer	42
The Ostreella Group	42
A. ostreella (Ragonot)	43
A. poohella	44
The Albidella Group	45
A. albidella (Hulst)	46
A. artella Shaffer	46
The Albicostella Group	47
A. albicostella (Grossbeck)	47
Genus *Atascosa* Hulst	48
A. glareosella (Zeller)	49
Genus *Homosassa* Hulst	50
H. ella Hulst	51
H. platella Shaffer	53
H. incudella Shaffer	54
Genus *Reynosa* Shaffer	54
R. floscella (Hulst)	55
Genus *Goya* Ragonot	56
G. stictella (Hampson)	56

Page

Subfamily Phycitinae 57
Genus *Anerastia* Hübner 58
A. lotella Hübner 59
Genus *Coenochroa* Ragonot 60
C. californiella Ragonot 61
C. illibella (Hulst) 65
C. bipunctella (Barnes and McDunnough) 67
Genus *Bandera* Ragonot 68
B. binotella (Zeller) 69
B. cupidinella Hulst 71
B. virginella Dyar 73
Genus *Wakulla* Shaffer 74
W. carneella (Barnes and McDunnough) 75
Genus *Tampa* Ragonot 75
T. dimediatella Ragonot 76
Genus *Barberia* Dyar 78
B. affinitella Dyar 78
Genus *Ragonotia* Grote 79
R. dotalis (Hulst) 80
Genus *Martia* Ragonot 83
M. arizonella Ragonot 84
Synonymical List of Species Considered 85
Unplaced Genera and Species 87
Literature Cited 90
Explanation of Figures 93

Introduction

This study began as a revision of the North American Anerastiinae, largely in the sense of the McDunnough (1939) checklist. In keeping with the original goals of the investigation, this paper treats all species formerly placed under that subfamily name, although *Anerastia* and several other genera are herein transferred to the Phycitinae, and *Peoria* is taken as the nominal genus of the subfamily. The transferred genera have not previously been treated in detail and so are discussed in this paper. The following introductory sections deal with the literature and history of the classification of all the genera formerly placed in the Anerastiinae.

The species of moths which previously constituted the subfamily Anerastiinae are a mixture of various pyralid elements. Members of this worldwide group are generally uncommon, rather inconspicuous insects of little or no economic importance, and perhaps largely for these reasons have received relatively little attention from taxonomists.

Much of the work which has been done on the North American Anerastiinae appeared during the last 15 years of the 19th century and is superficial by current standards. The only world monograph of the group is that of Ragonot (1901). Because existing works on the anerastiines have not been based on the detailed examination of species which is so necessary to a natural taxonomic system, a number of areas remain as major problems.

Identification of species has been difficult, even for specialists, because the descriptions and illustrations are inadequate. Most of the original descriptions occupy but a few lines of text and are almost useless for identifying the species. Illustrations of the adults are nearly absent from the literature with the exception of the Ragonot revision, a rare publication not easily available to most workers. The genitalia, one of the most taxonomically useful structures, are nowhere illustrated for North American species and are described in only a few instances. In addition most past studies were made from only one or a few specimens so that no account of individual and geographic variation was possible. Thus, reliable identifications can be made only by comparison with the type specimens. This is difficult because the types are scattered in various museums throughout the United States and Europe.

Placement of species into genera has been on the basis of usually one or a few superficial characters of wings, antennae, and palpi,

without emphasis on the sum of these characters and without examination of the genitalia. As a result most species have been misplaced, often associated in Old World genera to which they have no close affinities.

The Anerastiinae and Phycitinae have long been considered closely related within the Pyralidae and were often collectively recognized as the family Phycitidae. The two groups show close similarity in wing venation, notably the loss of vein R_5 in both groups. They also have similar palpi and the frenulum reduced to a single bristle in the females.

Separation of the Anerastiinae from the Phycitinae has been made on the basis of a single reduction character, loss or extreme reduction of the tongue, hence the supposed monophyletic nature of the group has been highly questionable. The results of the present investigation indicate that in North America eight genera properly belong with the phycitines and seven genera, forming a natural group, are quite distinctly separate from the Phycitinae. The latter of these two groups has been given subfamily status as the Peoriinae, a subfamily name proposed by Hulst.

The present study is preliminary; essentially all that is known of the group is based on studies of the adults; the immature stages and the biology of the living insects are almost wholly unknown. Food plant records are available for only two species of peoriines, both grass feeders. *Peoria bipartitella* is reported to feed on *Panicum lanuginosum*, and *Peoria tetradella* on *Elymus canadensis* as a borer in the stem. The life history of *Anerastia lotella*, a Holarctic species, is well described in the literature, notably by Buckler (1901). The species feeds on a number of grasses including *Ammophila arenaria*, *Festuca ovina*, *Secale cereale*, and *Aira* species. It is hoped that this paper will encourage taxonomic and biological studies on the Peoriinae throughout their worldwide range.

Materials and Methods

Specimens examined.—The U.S. National Museum and the Canadian National collection have provided most of the specimens used in this study. A complete listing of individuals and institutions from which material was borrowed is given below along with the abbreviations used in the text.

ABK	Collection of Alexander B. Klots, New York, N.Y.
AMNH	American Museum of Natural History, New York, N.Y.
ANS	Academy of Natural Sciences, Philadelphia, Pa.
BM	Collection of Bryant Mather, Jackson, Miss.
BMNH	British Museum (Natural History), London, England
BPI	State Bureau of Plant Industry, Harrisburg, Pa.
CM	Carnegie Museum, Pittsburgh, Pa.
CNC	Canadian National Collection, Ottawa, Ontario

CNHM	Chicago Natural History Museum, Chicago, Ill.
CPK	Collection of Charles P. Kimball, Sarasota, Fla.
CU	Cornell University, Ithaca, N.Y.
INHS	Illinois State Natural History Survey, Urbana, Ill.
JCS	Collection of the author, Shamokin Dam, Pa.
JGF	Collection of John G. Franclemont, Ithaca, N.Y.
KSU	Kansas State University, Manhattan, Kans.
LACM	Los Angeles County Museum, Los Angeles, Calif.
MOG	Collection of Murray O. Glenn, Henry, Ill.
UCB	University of California, Berkeley, Calif.
UK	University of Kansas, Lawrence, Kans.
UM	University of Minnesota, St. Paul, Minn.
USNM	U.S. National Museum, Washington, D.C.

Techniques.—Preparatory to examining the genitalia the abdomen was broken away from the thorax and macerated in cold 10 percent potassium hydroxide (KOH) solution for from 4 to 8 hours, then dissected in 50 percent alcohol. The abdomen was carefully torn open with jewelers' forceps along the entire right pleural area, enabling the cuticle to be mounted flat with the outer surface upward. The genitalia were separated by carefully tearing along the membrane between segments eight and nine. After the removal of loose scales and KOH, the male genitalia were usually stained with mercurochrome (0.3 percent aqueous solution), or occasionally with chlorazol black or acid fuchsin to improve rendition of various structures. The aedeagus was removed, and the valves were spread and held open by a small rectangular section of microscope slide placed over the genitalia. The genitalia were held in this position in 95 percent alcohol until hardened, then transferred successively to clove oil and xylene for about 15 minutes each, prior to mounting in Canada balsam on a microscope slide.

Female genitalia were put through the same series of chemicals as those of the males, but were usually stained with chlorazol black or mercurochrome.

In order to allow observation from any desired angle the genitalia of at least one specimen of each sex of each species were transferred from xylene into small (5 x 10 mm) genitalia vials, along with a drop of Cargille's type A microscope immersion oil; the males were left unspread. These specimens were eventually washed in xylene and mounted in balsam; before mounting they proved very useful in preparing descriptions because it was possible to study the relationships of the various structures.

Attempts to spread the male genitalia of the Peoriinae in the manner described above caused considerable distortion; thus the method had to be modified. If one will visualize the external male genitalia as the aedeagus and a surrounding cylinder, and then the cylinder as severed lengthwise, the genitalia can be "unrolled" and

flattened. In practice this was achieved by carefully separating the right valve from the vinculum and tearing the diaphragma so that the juxta remains adjacent to the right valve. The method was highly satisfactory as all the genitalic structures then lay flat in one plane. The genitalia were held flat, run through the alcohol, clove oil, xylene series, and mounted as explained above. Illustrations of the peoriine species and several other species were made with the male genitalia prepared in this manner.

Terms.—The Comstock-Needham system has been used in naming the wing veins (fig. 50). I have followed Kornerup and Wanscher (1962) for color terminology, viewing both the color plates and the specimen by incandescent illumination. Physiographic distribution terminology follows Lobeck (1948). Unless otherwise indicated, the phrase "North America" is taken to mean America north of Mexico.

Acknowledgments

The investigation was carried out under the direction of Prof. John G. Franclemont, to whom I wish to express my gratitude for his kind advice during the course of the project and for his helpful criticisms of the manuscript. A special note of appreciation is due Mr. Paul E. S. Whalley, who checked several type specimens in the British Museum (Natural History) against my descriptions and photographs; to Dr. Pierre E. L. Viette, who made available many of the Ragonot types in the Paris Museum; to Dr. Alexander B. Klots for his numerous helpful suggestions; to Dr. J. F. Gates Clarke, who suggested and encouraged my work on this interesting problem, and to Dr. H. E. Moore, Jr. and Dr. W. D. Duckworth, who offered useful comments on the manuscript.

I wish to thank the Allied Chemical Corporation for a contribution toward the cost of preparing the manuscript and for a grant which enabled me to spend one month collecting specimens at the Archbold Biological Station, Lake Placid, Fla. I am also indebted to the publisher of the Goode Base Map Series, Department of Geography, The University of Chicago, for granting permission to reproduce copyrighted material used in several of the plates. Maps 1 through 6 and Map 12 are based on Goode Base Map No. 202, copyright by the University of Chicago.

Finally, the investigation would not have been possible without the kind cooperation of numerous individuals and institutions who loaned specimens for my studies. I extend my appreciation to Dr. George W. Byers, University of Kansas; Mr. Harry K. Clench, Carnegie Museum; Mr. Hugh B. Cunningham, Illinois Natural History Survey; Dr. Donald R. Davis, U.S. National Museum; Dr. Howard E. Evans,

Museum of Comparative Zoology, Harvard University; Dr. John G. Franclemont, personal collection; Mr. Murray O. Glenn, personal collection; the late Dr. Harold J. Grant, Jr., Philadelphia Academy of Natural Sciences; Mr. Charles P. Kimball, personal collection; Mr. Norman Marston, Kansas State University; Mr. Lloyd M. Martin, Los Angeles County Museum; Mr. Bryant Mather, personal collection; Dr. Eugene Munroe, Canadian National collection; Dr. L. L. Pechuman, Cornell University; Dr. Jerry Powell, University of California, Berkeley; Dr. Frederick H. Rindge, American Museum of Natural History; Mr. George B. Sleesman, Pennsylvania State Bureau of Plant Industry; Dr. Frederick W. Stehr (now at Michigan State University), University of Minnesota; Mr. Paul E. S. Whalley, British Museum (Natural History); and Mr. Alex Wyatt, Chicago Natural History Museum.

Review of the Literature

The genus *Anerastia* Hübner [1826] originally comprised four species; three of these were transferred to *Hypochalcia* Hübner by Zeller (1848), and the one remaining species, *lotella* Hübner [1810–1813], was assumed to be the type of the genus although it was not explicitly designated as such until 1886 by Moore. In the original publication of *lotella*, Hübner gives only a watercolor figure, no description. Genitalia of both sexes were figured and described briefly by Pierce (1938).

Walker (1866) originally described *approximella*, the same species later being named *haematica* by Zeller (1872), and *roseatella* by Packard (1873). Zeller's paper included descriptions of three other new species of North American Anerastiinae.

In 1886 Ragonot established the family Phycitidae, based on *Phycita* Curtis, and divided it into the subfamilies Phycitinae and Anerastiinae based upon the "absence, or nearly so, of the tongue" in the latter group. He states his intention to prepare a monograph of the Phycitidae and Galleridae of the world and gives a review of previous works on these insects.

The publication of Hulst's "Descriptions of New Pyralidae" (1886) prompted Ragonot to publish new species of his own in advance of the projected monograph. The appearance of the Hulst papers at this time was in some respects unfortunate, for in the next several years both men published many new specific and generic names without seeing each other's types, thereby creating many synonyms. During 1887–89 Ragonot published 16 species and 15 genera, and Hulst published 7 species and 4 genera listed as new for the North American Anerastiinae.

Grote (1888) regarded ". . . the Phycidae or Phyciinae as a sub-family of the Pyralidae; the M. Ragonot's Anerastinae [sic] as merely a tribal division of the sub-family."

The first paper summarizing knowledge of the Anerastiinae was Hulst's (1890) "Revision of American Phycitidae." Therein he divided the family into the subfamilies Phycitinae and Peoriinae, the latter group largely corresponding to Ragonot's Anerastiinae, but excluding *Anerastia* and two other genera. The division was rather auspiciously made on the basis of the male genitalia, but unfortunately his assignment of genera into the two groups suggests that he neglected careful examination of these structures for most species. Indeed, genitalia are discussed for only 4 of the 19 peoriine genera included in the paper. The revision treats 30 species in 19 genera of Peoriinae, with 7 of the species and 4 of the genera being described as new.

The great world monograph of Ragonot (1901) was completed by Sir George F. Hampson after the author's death in 1895 and contains descriptions of 31 species and illustrations in color of 30 species (*lotella* Hübner not being illustrated) of North American Anerastiinae placed in 17 genera. Three species and one genus were described as new. A number of the specific names have since been synonymized, and several of the genera have been found not to be North American.

Hampson's (1918) classification of the subfamily termed the group Hypsotropinae based on *Hypsotropa* Zeller. He considered *dignella* Hübner to be the type of *Anerastia*, but Ragonot (1901) had already designated *lotella* Hübner as such. His paper covers the entire group and ascribes one new species to the North American fauna.

Sixteen new specific names have been added to the literature since the publication of Ragonot's monograph, these mostly in occasional papers by Dyar (1904, 1904a, 1906, 1908, 1923), Barnes and McDunnough (1913), Hampson (1918, 1930), and Grossbeck (1917). The most recent checklist for North America (McDunnough, 1939) gives 23 genera and 51 species, plus 1 genus and 10 species as junior synonyms. Heinrich's "Revision of the New World Phycitinae" (1956) transfers a number of genera across the subfamily lines.

Classification

As has been indicated previously, available information on the Anerastiinae is minimal, so that the present study is only a step toward a more reliable taxonomic system such as exists for many better known groups of insects. Nevertheless, morphological studies of adult specimens indicate that radical changes in the classification of the Anerastiinae are needed.

I have accepted the male genitalia as being the most reliable morphological indicators of natural relationships, especially at the generic level. They offer a relatively large number of stable characters. Female genitalia are in many cases too similar to be of much value in separating species, and even genera. Characters of wings, antennae, and palpi previously used to define genera often exhibit more intrageneric than intergeneric variation and consequently are by themselves extremely unreliable indicators of generic lines.

Numerous examples of wing venation variability could be given, and the following will illustrate the lack of reliability of venational characters: In the genus *Peoria* the presence or absence in the forewing of vein M_3 does not correlate with any other morphological feature investigated. This vein was present in about one-half of the specimens of *P. santaritella,* and one specimen possessed M_3 only on the right wing. Aberrations in the wing venation are very common within the subfamily, and the usefulness of any particular venational feature must be evaluated separately.

Orientation of the palpi may vary with the sex, and in living specimens the position they assume may be different from that found in dead specimens after desiccation. Unfortunately, most species have been described from very small series of specimens, so the variation has not always been apparent. Thus the use of this character in assigning species to genera has proved to be extremely unreliable.

The definition of the Anerastiinae has not generally been regarded as very satisfactory. Although most of the species have a distinctive habitus, this and the reduced tongue are not, in the absence of other substantial correlated characters, sufficient to define the group. Heinrich (1956), following Ragonot's division of the Phycitidae, felt that ". . . in the main the subfamilies [Phycitinae and Anerastiinae] themselves appear to be natural entities, although their definition leaves much to be desired."

On the basis of the genitalia, the North American Anerastiinae divide into two distinctly separate groups. One of these groups is composed of eight phycitine genera, including *Anerastia,* which seem to be related to diverse areas of that subfamily, and the remaining seven genera comprise a natural group, the Peoriinae.

The genitalia of both sexes in the peoriines differ distinctly from those in the phycitines. Females all have the ovipositor greatly compressed, probably as an adaptation for a particular mode of oviposition. In the males the uncus is so different from its usual appearance in the phycitines as to be nearly unrecognizable in the North American species. Indeed, the assumption that these terminal parts represent uncus is based on an examination of several Old World peoriine

genera in which the uncus is similar, in varying degrees, to that of the phycitines.

A number of other features are generally, but not exclusively, characteristic of the Peoriinae. In all species the males have two to five (possibly more) basal antennal segments fused to some degree, the exact number often varying within a species. Longitudinal wing markings are more common than transverse ones, and the ocelli are well developed in all the species examined.

Inasmuch as the present state of our knowledge is so unsatisfactory, the author hopes to undertake studies of the group on a world basis to better deal with the problem. The interpretation of just how closely the Phycitinae and the Peoriinae are related will depend in part on how homologies between the male genitalic structures of the two groups are interpreted, and in part on the significance of the compressed ovipositor. A better understanding of this problem will require examination of the genitalic structures of all the species, and perhaps studies of their embryology and soft-part anatomy as well. Life history studies would be extremely valuable and should help to elucidate the functional significance of the compressed ovipositor.

Subfamily Peoriinae [1] Hulst

Hulst, 1890, p. 102.

Diagnosis.—Similar to Phycitinae; distinguished by spicate modifications of uncus in males and by highly compressed ovipositor of females.

Description.—Labial palpi well developed, maxillary palpi moderate to very small; male antennae with basal segments of shaft variously fused; tongue reduced; ocelli well developed.

Forewing maculation predominantly longitudinal; transverse bands, when present, usually expressed as dots, more rarely solid; 10 or 11 veins; R_1 free from cell; R_{3+4} stalked; R_5 absent; M_1 free from cell; Cu_2 free from cell. Hindwing with 6 or 7 veins; Rs closely approximate to or stalked with $Sc+R_1$ beyond cell; frenulum of female simple.

Male genitalia with uncus bearing spicate processes. Gnathos various, usually bearing medial process. Transtilla absent (except in *Goya*). Juxta well developed, various. Vinculum well developed. Eighth abdominal segment without special hair tufts.

Female genitalia with ovipositor strongly compressed. Eighth abdominal segment compressed, rarely well expanded anteriorly. Apophyses well developed, approximately equal in length. Ductus

[1] Based upon North American species.

bursae moderately short. Bursa well developed, rarely armed. Ductus seminalis from or near posterior end of bursa.

Key to Genera of Peoriinae Based Upon the Male Genitalia

Within the Peoriinae intrageneric variation of alar, palpal, and antennal features seriously limits their usefulness in separating genera. In the absence of other distinguishing features, keys to genera must rely on characters of the male genitalia. Whenever slide preparation is impractical, reasonably certain determinations can often be made by comparing external features of the specimens to descriptions and photographs of adults. Genitalia slides should be prepared if correct identification is critical. It is suggested that the indicated figures be consulted when using the keys.

1. Each spicate process (of uncus) basally branched into two long perpendicular tapering spines of nearly equal length; spicate processes connected by medial bandlike process (fig. 51) 2
   Spicate processes unbranched, or one branch at least twice length of other; medial process absent or not bandlike 3
2. Medial process of uncus bearing prominent posteromedial protuberance; juxta with pair of setaceous tubercles (fig. 118) . . . . . **Anacostia**
   Medial process of uncus unarmed, or with minute cusps only; juxta without pair of setaceous tubercles (figs. 105–117) . . . . . **Peoria**
3. Spicate processes unbranched, blunt, elbowed in middle; gnathos tapering to single sharp apical spine (fig. 126) . . . . . **Atascosa**
   Spicate processes various, not angled; gnathos with medial process not a single sharp spine 4
4. Each spicate process with rhomboidal lateral pad; juxta elliptical; aedeagus strongly tapered (fig. 131) . . . . . **Goya**
   Rhomboidal pad absent; juxta rectangular or shield shaped; aedeagus not strongly tapered 5
5. Each spicate process a recurved stout hook shorter than gnathos arm, tapering to sharp point; gnathos apically tricuspidate (fig. 130) . . . . . **Reynosa**
   Spicate processes not as above, at least as long as gnathos arm; gnathos not apically tricuspidate 6
6. Apical process of gnathos digitate; spicate processes each with long lateral and much shorter caudal branches (figs. 119–125) . . . . . **Arivaca**
   Gnathos without digitate apical process; spicate processes unbranched (figs. 127–129) . . . . . **Homosassa**

Peoria Ragonot

Aurora Ragonot, 1887, p. 18; 1889, p. 117. — Hulst, 1890, pp. 209–210. — Smith, 1891, p. 84. — Ragonot, 1901, p. 337. — Hulst, 1902, p. 437. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 106. — Forbes, 1923, p. 638. — McDunnough, 1939, p. 35. [New synonymy. Type: *Aurora longipalpella* Ragonot, 1887. Monobasic.]

Peoria Ragonot, 1887, p. 19; 1889, p. 117. — Hulst, 1890, p. 213. — Smith, 1891, p. 85. — Ragonot, 1901, p. 386. — Hulst, 1902, p. 439. — Barnes and

McDunnough, 1917, p. 149. — Forbes, 1923, p. 638. — McDunnough, 1939, p. 36. [Type: *Anerastia haematica* Zeller, 1872. Original designation.]

Statina Ragonot, 1887, p. 19; 1889, p. 117. — Hulst, 1890, p. 216. — Smith, 1891, p. 85. — Ragonot, 1901, p. 415. — Hulst, 1902, p. 440. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 59. — McDunnough, 1939, p. 36. [New synonymy. Type: *Statina roseotinctella* Ragonot, 1887, p. 19. Monobasic.]

Calera Ragonot, 1888, p. 50. — Smith, 1891, p. 85. — Ragonot, 1901, p. 417. — Hulst, 1890, p. 217. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 59. — Hulst, 1902, p. 441. — Forbes, 1923, p. 639. — McDunnough, 1939, p. 36. [New synonymy. Type: *Calera punctilimbella* Ragonot, 1888, p. 50. Monobasic.]

Altoona Hulst, 1888, p. 116; 1890, pp. 206–207. — Smith, 1891, p. 84. — Hulst, 1902, p. 438. [New synonymy. Type: *Anerastia opacella* Hulst, 1887. Original designation.]

Cayuga Hulst, 1888, p. 116; 1890, pp. 208–209. — Smith, 1891, p. 84. — Hulst, 1902, p. 438. [New synonymy. Type: *Spermatophthora gemmatella* Hulst, 1887. Monobasic.]

Volusia Hulst, 1890, p. 206 [not Robineau-Desvoidy, 1830, p. 674, in Diptera, Ortalidae; not Adams, 1861, p. 306, in Gastropoda]. — Smith, 1891, p. 84. [New synonymy. Type: *Volusia roseopennella* Hulst, 1890. Monobasic.]

Wekiva Hulst, 1890, p. 215. — Smith, 1891, p. 85. — Hulst, 1902, p. 440. [New synonymy. Type: *Wekiva nodosella* Hulst, 1890. Monobasic.]

Osceola Hulst, *in* Smith, 1891, p. 85 [not Baird and Girard, 1853, p. 133 p. 133, in Reptilia]. [Nomen nudum. New synonymy. Type: *Chipeta perlepidella* Hulst, 1892. Monobasic.]

Chipeta Hulst, 1892, p. 62. — Barnes and McDunnough, 1917, p. 150. — McDunnough, 1939, p. 36. [New synonymy. Type: *Chipeta perlepidella* Hulst. 1892. Monobasic.]

Chipota [sic] — Hulst, 1902, p. 441. [Misspelling for *Chipeta*.]

Trivolusia Dyar, 1902 [1903], p. 438. [New synonymy. Type: *Volusia roseopennella* Hulst, 1890. Monobasic.]

Ollia Dyar, 1904, pp. 107–108. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36. [New synonymy. Type: *Ollia santaritella* Dyar, 1904. Monobasic.]

Diagnosis.—Members of this rather variable genus may be recognized by the characteristic uncus with its bandlike medial process and paired spicate processes, bifurcate with each arm round, slender, sharply pointed, and oriented at about 90 degrees to the other (fig. 51).

Description.—Labial palpi porrect (obliquely ascending in *luteicostella*); tongue rudimentary; antennae with base compressed, male shaft with basal segments partly fused, female with shaft filiform, finely ciliate.

Forewings with 10 or 11 veins; R_1 from cell well before upper outer angle; R_2 from cell near base of or stalked with R_{3+4}; R_{3+4} always stalked, from just before the angle; M_1 from the angle; M_2 stalked or fused with M_3; M_3 sometimes stalked with Cu_1; Cu_1 at or near lower outer angle of cell; Cu_2 from just before the angle. Hindwings with 6 or 7 veins; Sc and Rs closely approximate or stalked; M_1 from upper

outer angle of cell; M_2 absent; M_3 stalked with Cu_1 for at least one-third of its length, sometimes fused; Cu_1 from lower outer angle; Cu_2 from just before the angle.

Male genitalia with uncus bearing bandlike medial process; spicate processes each terminating in slender, sharply pointed ventrad and caudad arms. Gnathos arms broad and flat. Vinculum well developed, broadly rounded. Aedeagus somewhat flattened, three to four times as long as broad; vesica, when armed, bearing one or two cornuti.

Female genitalia with posterior and anterior apophyses of about equal length, well developed. Ductus bursae moderately short. Bursa unarmed. Ductus seminalis from posterior end of bursa, broadened at base.

Discussion.—The genus includes 13 known species and is the largest in the American fauna of the subfamily. Affinities vary within the genus, and the species have been grouped to show relationships in so far as this is possible with a linear arrangement.

There is enough variation of characters within many of the species to render difficult the construction and use of keys. To aid in the identification of specimens, a chart summarizing the characters found to be of greatest value in separating species is included in addition to the key.

In a few cases the male genitalia are quite distinctive of the species, but for the most part the differences are rather subtle. The form of the gnathos, number of cornuti in the vesica, and shape of the valvae (not summarized in table, see figures) are the most useful characters of the male genitalia.

Navasota hebetella may belong to Peoria and has been included in the key (see Unplaced Genera and Species, p. 87).

In accordance with the recommendation of the Code (Article 24), I have chosen the name *Peoria* for this genus rather than the lesser known *Aurora* which has page precedence.

Explanation of Table 1

1. Forewing, vein R_2
   x=free from cell
   o=stalked with R_{3+4}
2. Forewing, vein M_2
   x=stalked with M_3
   *=fused with M_3 (apparently absent)
3. Forewing, vein Cu_1
   x=free from cell
   o=stalked with M_3
4. Forewing, region anterior to cell
   x=abruptly pale, with few or no darker scales
   o=not abruptly pale, Sc and Rs sometimes white traced

285-934—68——2

5. Forewing
   x=ground darker posterior to cell, at least at base
   o=ground not darker posterior to cell
6. Forewing
   x=some or all veins white traced
   o=without white tracing on veins
7. Forewing, transverse posterior line
   x=present
   *=represented by dots
   o=absent
8. Labial palpi
   p=porrect
   a=ascending
9. Maxillary palpi
   x=reaching frons or nearly so
   o=small, not approaching frons
10. Male antennae
    l=laminate
    S=serrate
    ss=subserrate
11. Gnathos of male genitalia
    a=with apical process
    l=with pair of subapical processes
    o=without special processes
12. Aedeagus, number of cornuti in vesica

The use of two symbols separated by a comma indicates two characters appearing with about equal frequency. A symbol in parentheses indicates a character appearing less frequently than its alternative.

TABLE 1.—*Summary of characters found to be the most useful in distinguishing species of* Peoria*

Species	1	2	3	4	5	6	7	8	9	10	11	12
longipalpella	o	x	x	o	o	o	x	p	x	ss	a	1
bipartitella	o	*	x	o(x)	x(o)	x(o)	o	p	x	l	a	1
tetradella	x,o	x	x	x	o	x	o	p	x	ss	a	1
opacella	x,o	x	x	o	x	x	o	p	x	l	a	1
floridella	x,o	x	x	o	x	x	o	p	o	l	a	1
rostrella	o	x	x	o	o	x	o	p	x	ss	a	1
gemmatella	x	x	x	o	o	x	o	p	o	l	a,o	2
roseotinctella	o	*	o	x,o	o	x	*	p	o	l	a(o)	2
johnstoni	o	*	x	o	o	x	o	p	o	ss	o	2
santaritella	x	*,x	x	o	x	o	o	p	o	S	a	1
holoponerella	x	x	x	x	o	o	o	p	o	S	a	1
approximella	o	*	x	x	o	o	o	p	o	l	l	0
luteicostella	o	*	x	x	o	o	o	a	o	l	l	1

*See explanation on preceding pages.

Key to the Species of Peoria Based Upon External Features

1. R_2 stalked with R_{3+4}; M_2 absent 2
   R_2 not stalked with R_{3+4}; if stalked, then M_2 present 7
2. M_3 stalked with Cu_1; hindwing M_3 absent 3
   M_3 not stalked with Cu_1, sometimes from point; hindwing M_3 usually present 4
3. Transverse posterior indicated by line of dots (fig. 10). . . . . **roseotinctella**
   Transverse posterior absent; terminal line of dots present . . **N. hebetella**
4. Forewing abruptly pale anterior to cell, with no more than a few scattered nonwhite scales. 5
   Forewing not abruptly pale anterior to cell 6
5. Forewing pale posterior to A_2; palpi porrect (fig. 14) . . . . . **approximella**
   Forewing not pale posterior to A_2; palpi ascending (fig. 12) . . **luteicostella**
6. Forewing darker posterior to cell; maxillary palpi approaching frons; (fig. 13) . . . . . **bipartitella**
   Forewing not darker posterior to cell; maxillary palpi not approaching frons; (fig. 1) . . . . . **johnstoni**
7. Forewing with transverse bands (fig. 9) . . . . . **longipalpella**
   Transverse bands absent 8
8. Forewing light buff, abruptly pale anterior to cell (figs. 3, 4) . . **holoponerella**
   Forewing not abruptly pale anterior to cell 9
9. Veins traced with white 11
   Veins not traced with white 10
10. Ground white anterior to cubitus; cubitus bordered posteriorly with red; maxillary palpi not reaching frons (fig. 5) . . . . . **santaritella**
    Ground a mixture of brown and white scales; usually lighter anterior to cubitus, at least near base; maxillary palpi reaching frons (fig. 11) . . . . . **opacella**
11. Forewing darker posterior to cell, at least near base 12
    Forewing not darker posterior to cell 13
12. A_2 traced with white, bordered with brown; maxillary palpi not reaching frons (fig. 8) . . . . . **floridella**
    A_2 not traced with white; maxillary palpi reaching frons (fig. 11). . . **opacella**
13. Cubitus and lower outer angle of cell broadly traced with white (fig. 6) . . . . . **tetradella**
    Not as above; Sc and Rs traced with white; ground reddish brown 14
14. R_2 free from cell (fig. 7) . . . . . **gemmatella**
    R_2 stalked with R_{3+4} (fig. 2) . . . . . **rostrella**

Peoria longipalpella (Ragonot), new combination

FIGURES 9, 51, 70, 105, 144

Aurora longipalpella Ragonot, 1887, p. 18. — Hulst, 1890, p. 210. — Smith, 1891, p. 84. — Ragonot, 1901, pp. 337–338. — Hulst, 1902, p. 437. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 106. — Forbes, 1923, p, 638. — McDunnough, 1939, p. 35. — Kimball, 1965, p. 250.

DIAGNOSIS.—This is the only known species of *Peoria* in which the forewings are marked with unbroken transverse bands, although transverse rows of dots occur in a few other members of the genus.

Description.—Frons brown; labial palpi with basal segments white, second and third segments brown on outer sides, white ventrally and on inner sides; maxillary palpi reaching frons, brown; antennae brown, male subserrate; occiput laterally, patagia, and tegulae brown, vertex and occiput light brown dorsally.

Forewings with ground white anterior to cubitus, brown posterior to cell; cell sprinkled with brown, with orange red anterior to cell; transverse anterior and posterior bands brown; ground brown on underside, bands darker; with 11 veins; R_2 stalked with R_{3+4}; M_{2+3} stalked. Hindwings light brown; 7 veins; Sc and Rs stalked; M_3 stalked with Cu_1.

Male genitalia with gnathos bearing apical digitate projection. Juxta U-shaped. Valvae with costa sparsely setose, terminating in sharp projecting tooth; sacculus densely pubescent. Aedeagus with vesica bearing a single serrate cornutus.

Female genitalia with ovipositor tip moderately setose, caudal margin with numerous fine setae, sparsely setose laterally. Apophyses curved at base, posterior with base pointed and slightly flattened; anterior with base thickened.

Type.—In the British Museum (Natural History).

Type data.—Lectotype female, hereby designated, "667; U.S.A.; n. gen. R. longipalpella Rag"; genitalia slide No. 707, J. Shaffer, Jan. 4, 1967. The specimen is glued together between the meso- and metathorax. Type data given with the original description consists of: "♀ 22 mill." Ragonot (1901) in a presumed reference to the type reports: "Amerique boreale, 11 octobre. Unc ♀. Mus brit."

Specimens examined.—2 ♂, 2 ♀.

Distribution (Map 8).—Recorded from North Carolina and Virginia.

UNITED STATES: North Carolina, Polk Co., Tryon, 1 ♀, no date (Fiske), [USNM]; Wake Co., Raleigh, 1 ♀, "M. Aug. 09," [USNM].

Virginia: Arlington Co., Arlington, 1 ♂, Aug. 28, 1951 (J. G. Franclemont), [USNM].

Locality unknown: 1 ♂, no date, Sweadner collection [CM].

Discussion.—Kimball reports the species from Siesta Key, Fla., May 13, 1946, but I have not seen the specimen.

Peoria bipartitella Ragonot

Figures 13, 71, 106, 145

Peoria bipartitella Ragonot, 1887, p. 19; 1889, p. 117. — Hulst, 1890, p. 214. — Smith, 1891, p. 85. — Ragonot, 1901, p. 386. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

Volusia roseopennella Hulst, 1890, p. 206. — Smith, 1891, p. 84. — Rindge, 1955, p. 170. [New synonymy.]
Tolima roseopennella (Hulst). — Ragonot, 1901, p. 340. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 35. — Kimball, 1965, p. 250.
Trivolusia roseopennella Hulst, 1902, p. 438. — Grossbeck, 1917, p. 134.
Commotria roseopennella (Hulst). — Hampson, 1918, p. 108.
Hypsotropa bipartitella (Ragonot). — Hampson, 1918, p. 78.
Peoria bipunctella Ragonot. — Forbes, 1923, p. 639. [Not Ragonot.]

Diagnosis.—The presence of a well-developed digitate medial process on the gnathos serves to delimit this species from among those of the genus with similar wing venation.

Description.—Frons conical, varying brown to light pink; labial palpi with basal segments white, outer sides of second and third segments varying brown to light pink, inner sides with white-tipped scales; maxillary palpi approaching frons, brownish white; antennae light brown, laminate in male; occiput brown, vertex white behind antennae, patagia and tegulae varying grayish red to brown, legs grayish red to brown on outer sides, white on inner sides.

Forewings with extremely variable maculation; area anterior to cell red, brown, white, or mixtures of scales of these colors; cell usually red or white, brown in some (Mississippi) specimens, often a mixture of these three colors; area posterior to cell usually red, sometimes brown; veins traced with white, tracing variable, sometimes absent; 10 veins, R_2 stalked with R_{3+4}; M_{2+3} fused, from lower outer angle. Hindwings light brown, darker in apical area; 7 veins; M_3 and Cu_1 long stalked.

Male genitalia with gnathos bearing apical digitate process. Juxta V-shaped. Vinculum with anterior margin flat and flanged. Valvae with costa sparsely setose, bearing blunt apical tooth; sacculus with fine hairs. Aedeagus with vesica bearing single subserrate cornutus.

Female genitalia with ovipositor finely setose on caudal margin, moderately setose laterally. Apophyses curved, posterior curving upward at base and tapering to point, anterior slightly thickened at base.

Types.—P. *bipartitella*, in the Museum National d'Histoire Naturelle; V. *roseopennella*, in the American Museum of Natural History.

Type data.—P. *bipartitella*, lectotype female, hereby designated, North Carolina, Morrison; genitalia slide No. 534, J. Shaffer, May 14, 1965; *V. roseopennella*, lectotype male, hereby designated, Florida, March; genitalia slide No. 3220, Carl Heinrich, June 14, 1946; the original description reports "Volusia County, Fla.," no date.

Recorded host.—Poaceae: *Panicum lanuginosum* Ell. from slide label in USNM, specimens taken July 8, 1950, Kill Devil Hills, N.C.

Specimens examined.—34 ♂, 19 ♀.

Distribution (Map 8).—Chiefly the Atlantic and Gulf Coastal Plain, recorded from Mississippi to Massachusetts, also from north central Illinois.

Fernald (1950) reports the food plant as occurring in "Sandy open soil, thin woods, etc., Fla. to Tex., n., rather locally, to s. R.I."

UNITED STATES: Florida: Alachua Co., Gainesville, 2♂, July 8, 1927 (J. Speed Rogers) [CU, USNM]; 1♂, July 1927 (J. Speed Rogers) [CU]; Highlands Co., Lake Placid, 1♀, Mar. 6, 1945 (J. G. Needham) [CU]; Manatee Co., Myakka City, 1♀, Feb. 17, 1945 (J. G. Needham) [CU]; Sarasota Co., Siesta Key, 1♂, Feb. 28, 1951 (C. P. Kimball) [CNC].

Illinois: Putnam Co., 1♀, Aug. 29, 1961 (M. O. Glenn) [MOG]; 1♀, Aug. 1, 1964; 1♀, Aug. 29, 1964.

Massachusetts: Barnstable Co., Barnstable, 1♂, July 10, 1949 (C. P. Kimball) [CNC]; 1♂, 2♀, July 11, 1949 (C. P. Kimball) [CNC, CPK]; 2♂, July 14, 1949 (C. P. Kimball) [CNC]; 1♂, July 15, 1949 (C. P. Kimball) [CPK]; West Barnstable, 2♂, 1♀, July 16, 1949 (C. P. Kimball) [CNC, CPK]; Barnstable, 1♂, July 11, 1950 (C. P. Kimball) [CPK]; 1♂, July 28, 1950; 1♀, Aug. 7, 1952; 1♂, July 4, 1958; Dukes Co., Martha's Vineyard, 1♀, Aug. 1, 1926 (F. M. Jones) [CNC]; 1♂, Aug. 8, 1941 (F. M. Jones) [USNM]; 1♀, Aug. 4, 1944 (F. M. Jones) [ANS]; 1♂, Aug. 6, 1944; 1♂, Aug. 6, 1946 (F. M. Jones) [CNC]; 1♂, Aug. 4 (F. M. Jones) [USNM]; 1♀, Aug. 21 (F. M. Jones) [USNM]; Vineyard Haven, 1♂, July 17 (F. M. Jones) [ANS]; Plymouth Co., Agric. Exp. Sta., East Wareham, 1♂, July 11, 1962 [CPK].

Mississippi: Forrest Co., Camp Shelby, 6♂, 3♀, Sept. 1–15, 1944 (C. D. Michener) [AMNH]; 2♂, Sept. 16–30, 1944.

New Jersey: Bergen Co., Oakland, 1♂, Aug. 5, 1948 (C. P. Kimball) [CPK]; 1♂, Aug. 13, 1948 (C. P. Kimball) [CNC]; 1♀, Aug. 14, 1948; Burlington Co., Whitesbog, 1♀, July 12, 1939 (E. P. Darlington) [ANS]: 1♂, Aug. 2, 1940.

North Carolina: Macon Co., Horse Cove, Highlands, 1♂, Aug. 3, 1957 (C. J. Curen) [CNC]; Polk Co., Tryon, 1♂, Aug. 18, 1903 (Fiske) [USNM]; 1♀, no date.

Virginia: Nasemond Co., Holland, 1♀, Aug. 11, 1944 (O. Buchholz) [ANS].

Peoria tetradella (Zeller), new combination

Figures 6, 72, 107, 146

Anerastia tetradella Zeller, 1872, pp. 552–553.

Saluria tetradella (Zeller). — Ragonot, 1889, p. 117; 1901, pp. 362–363. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 102. — McDunnough, 1939, p. 36.

Altoona tetradella (Zeller). — Hulst, 1890, p. 207. — Smith, 1891, p. 84.

Diagnosis.—The broad white band on the cubitus and lower outer angle of the cell marks this species as distinct from other members of the genus.

Description.—Frons brown; labial palpi with basal segments white, second and third segments gray on outer sides, white on inner sides and ventrally; maxillary palpi reaching frons, light brown; antennae light brown, male subserrate; occiput laterally, patagia, and tegulae

light brown, occiput dorsally and vertex white, legs white on inner sides, outer sides clothed with white-tipped brown scales.

Forewings with white band anterior to cell tapering to point at apex, sprinkled with reddish-brown scales, bordered posteriorly by dark brown band of varying width, often extending to A_1 fold, frequently scattered with reddish-brown scales; reddish brown posterior to A_1 fold, A_2 white traced and bordered with dark brown scales; veins traced with white, very prominently so at lower outer angle of cell; 11 veins; R_2 from cell close to base of or stalked with R_{3+4}; M_{2+3} stalked. Hindwings light brown, darker toward apex; with 7 veins.

Male genitalia with gnathos bearing apical digitate projection. Juxta V-shaped. Vinculum flanged and thickened at apex. Valvae pointed apically; costa sparsely setose; sacculus with fine hairs. Aedeagus with vesica bearing single serrate cornutus.

Female genitalia with ovipositor bearing numerous fine setae on caudal margin, tip moderately setose. Apophyses curved, posterior tapering to point.

Type.—In the British Museum (Natural History) (from the Zeller collection).

Type data.—In the original description Zeller notes: "Vaterland: Texas (Boll, Belfrage). Mehrere ♂ und ♀ fing Belfrage in der ersten Hälfte des June, 2 ♀ am 8. und 9. Juli."

Lectotype male, hereby designated, labeled: "10/6, Bosque Co Texas, Tetradella Z. Texas [green label in Zeller's handwriting], Zell. Coll. 1884, ♂ genitalia slide 6–II–1967 J. Shaffer No. 728."

Lectoparatypes: One male and four females, all labeled Bosque County, Tex. and bearing Zeller's personal type label; male dated 11/6 (June 11), two females dated 7/6, other two females dated 8/7 and 9/7.

Recorded host.—Poaceae: *Elymus canadensis* L., borer in stem. From specimen label, three males, Lafayette, Ind.

The host occurs throughout most of the United States and southern Canada. Hitchcock (1951) notes: "River banks, open ground, and sandy soil, Quebec to southern Alaska, south to North Carolina, Missouri, Texas, Arizona, and northern California."

Specimens examined.—22 ♂, 41 ♀.

Distribution (Map 6).—California to Texas, northeastward to Ontario.

UNITED STATES: California: Modoc Co., Canby, 2 ♂, July 20, 1927 [CU]; county unknown, "Mad R. ab. Maple Cr.," 1 ♂, July 28–29, 1927 [CU].

Illinois: Putnam Co., 1 ♀, Aug. 6, 1958 (M. O. Glenn) [MOG]; 1 ♂, June 21, 1961; 1 ♂, July 10, 1961; 1 ♀, July 12, 1961; 1 ♀, July 17, 1961; 1 ♀, June 24, 1962; 1 ♀, July 5, 1962; 1 ♂, June 23, 1963; 1 ♀, July 2, 1964.

Indiana: Tippecanoe Co., Lafayette, 3 ♂, 1916 (C. N. Ainslie) [USNM].

Kansas: Thomas Co., (3150 ft.), 1 ♂, no date (F. X. Williams) [UK].

Texas: Blanco Co., 1 ♀, May [USNM]; 1 ♀, June [AMNH]; 1 ♂, 1 ♀, July [AMNH]; 1 ♀, August [AMNH]; 2 ♀, no date, [USNM]; Bosque Co., 1 ♂, "11/6" (Zeller collection) [BM]; Burnet Co., 2 ♂, no date (F. G. Schaupp) [USNM]; Collin Co., Plano, 4 ♀, July (E. S. Tucker) [USNM]; Dallas Co., 1 ♀, June [AMNH]; Kerr Co., Kerrville, 1 ♀, May 30, 1906 (F. C. Pratt) [USNM]; 3 ♀, May 31, 1906; 1 ♂, 2 ♀, June 1, 1906; 1 ♀, Apr. 11, 1907; 1 ♀, no date; La Salle Co., Cotulla, 1 ♀, May 12, 1906 (Crawford and Pratt) [USNM]; Medina Co., Sabinal River opposite Hondo, 1 ♂, July 1, 1917 [CU]; county unknown, "Black Jack Spgs.," 1 ♀, no date [USNM]; locality unknown, 5 ♀ [USNM]; 3 ♂, 5 ♀ [INHS].

CANADA: Ontario: Port Colborne, 1 ♂, June 24, 1934 (J. J. de Gryse) [CNC].

Peoria opacella (Hulst), new combination

Figures 11, 73, 108, 147

Anerastia opacella Hulst, 1887, p. 138. — Rindge, 1955, p. 168.
Altoona opacella Hulst, 1887, p. 116; 1890, p. 207. — Smith, 1891, p. 84. — Hulst, 1902, p. 438.
Saluria dichroeella Ragonot, 1889, pp. 113, 117. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36. [New synonymy.]
Tolima opacella (Hulst). — Ragonot, 1889, p. 117; 1901, p. 341. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 35.
Altoona dichroeella (Ragonot). — Hulst, 1890, p. 207.
Altoona dichrocella [sic]. — Smith, 1891, p. 84.
Saluria dichrocella Hampson *in* Ragonot, 1901, p. 363; 1918, p. 101. [New synonymy, objective.]
Saluria dichroella [sic]. — Hulst, 1902, p. 439.
Commotria opacella (Hulst). — Hampson, 1918, p. 108.

Diagnosis.—This species is distinguished from all other members of the genus with similar venation by the combination of the forewing being basally darker posterior to the cell and the absence of white tracing on forewing vein A_2.

Description.—Frons oblique, scales brown with white tips; labial palpi with basal segments white, second and third segments clothed with white-tipped brown scales dorsally and on outer sides, with light brown to white scales ventrally and on inner sides; maxillary palpi almost reaching frons; antennae brown, laminate in male; occiput behind eye, patagia, and tegulae brown, vertex behind antennae and dorsum of occiput light brown; legs with tarsi clothed with white-tipped brown scales.

Forewings brown, darker posterior to cubitus, especially basal half; all veins except anals variously traced with white; areas between veins a mixture of white and brown scales; usually solid brown posterior to cubitus, becoming lighter distally. Hindwings light brown, slightly darker in apical region. Venation as in *tetradella*.

Male genitalia with gnathos bearing apical digitate projection. Juxta V-shaped. Vinculum with anterior edge flattened and flanged. Valvae with costa sparsely setose, sometimes with short apical tooth;

sacculus with numerous fine hairs. Aedeagus with vesica bearing a single serrate cornutus.

Female genitalia with ovipositor tip and caudal margin moderately setose, sparsely setose laterally. Posterior apophyses curved on basal third, base flattened, tear-shaped, tapering to point; anterior slightly curved.

TYPES.—*A. opacella*, in the American Museum of Natural History (lectotype), in the U.S. National Museum (lectoparatype); *S. dichroeella*, in the Muséum National d'Histoire Naturelle.

TYPE DATA.—*A. opacella*, lectotype male, hereby designated, Blanco Co., central Texas, collection G. D. Hulst, genitalia slide No. 3221, Carl Heinrich, June 14, 1946.

Lectoparatype: Texas, one female, Fernald collection; USNM 40080; genitalia slide No. 1107, Carl Heinrich, Apr. 5, 1938.

S. dichroeella, lectotype male, hereby designated, Texas, October, genitalia slide No. 533, J. Shaffer, May 14, 1965.

SPECIMENS EXAMINED.—47 ♂, 46 ♀.

DISTRIBUTION (Map 7).—Arizona, New Mexico, southwestern Texas to Brownsville.

UNITED STATES: ARIZONA: Cochise Co., Cochise Stronghold, 1 ♀, Aug. 30, 1958 (P. Opler) [UCB]; Ramsay Canyon, Huachuca Mts., 1 ♀, July 10–15, 1941 (A. B. Klots) [AMNH]; Southwestern Res. Sta., 5 mi. west Portal (5400 ft.), 1 ♂, July 7, 1956 (Cazier and Ordway) [AMNH]; 1 ♀, July 9, 1956; 1 ♀, July 20, 1957 (M. Statham) [AMNH]; 1 ♂, Aug. 2, 1956 (C. and M. Cazier) [AMNH]; 1 ♂, July 26–Aug. 3, 1959 (A. B. Klots) [ABK]; Cococino Co., 6⅓ mi. EESE. Flagstaff (6500 ft.), 1 ♂, Aug. 7, 1964 (J. G. Franclemont) [JGF]; Vail Lake Rd., 9½ mi. SE. Flagstaff (6500 ft.), 1 ♀, July 11, 1961 (J. G. Franclemont) [JGF]; 1 ♀, July 18, 1961 (R. W. Hodges) [JGF]; Pima Co., Baboquivari Mts., 4 ♀, July 1–15, 1923 (O. C. Poling) [USNM]; 13 ♂, 4 ♀, July 15–30, 1923; 1 ♀, July 27–31, 1923; 3 ♀, Aug. 1–4, 1923; 7 ♀, Aug. 1–15, 1923; 3 ♀, Aug. 15–30, 1923; 2 ♀, Aug. 24–31, 1923; 1 ♀, Sept. 1–15, 1923; 2 ♀, July 1–15, 1924; 5 ♀, Aug. 15–30, 1924; 1 ♀, Sept. 15–30, 1924; 2 ♀, no date, (F. H. Snow) [UK]; 1 ♀, no date (F. H. Snow) [USNM]; Pinal Co., Desert Arboretum, Superior, 1 ♂, July 18–21, 1941 (A. B. Klots) [AMNH]; Santa Cruz Co., Santa Rita Mts., Madera Canyon (4880 ft.), 1 ♂, July 9, 1959 (J. G. Franclemont) [JGF]; 1 ♂, Aug. 23, 1959.

NEW MEXICO: Eddy Co., White City, 2 ♂, May 15, 1950 (E. C. Johnston) [CNC]; 1 ♂, May 16, 1950; 1 ♂, May 17, 1950; 1 ♀, July 23, 1959 (A. B. Klots) [ABK].

TEXAS: Brewster Co., Alpine, 2 ♂, May 22, 1950 (E. C. Johnston) [CNC]; Cameron Co., Brownsville, 1 ♂, no date [USNM]; San Benito, 4 ♂, March 16–23 [USNM]; 1 ♂, March 24–30; 1 ♂, 1 ♀, July 16–23; 1 ♀, July 24–31; 1 ♂, no date; Hidalgo Co., Mercedes, 2 ♂, Aug. 31, 1958 (H. Smalzried) [AMNH]; Jeff Davis Co., Ft. Davis, 2 ♂, May 20, 1950 (E. C. Johnston) [CNC]; Limpia Canyon, 8 ♂ 1 ♀, May 20, 1950 (E. C. Johnston) [CNC]; 1 ♂, June 4, 1950.

DISCUSSION.—The species shows close affinities to *tetradella* and *floridella*, particularly to the latter.

Wing maculation in *opacella* is rather variable, especially with respect to the degree of white tracing on the veins. The variation is apparent within local populations and does not appear to be geographic.

Peoria floridella, new species

FIGURES 8, 55, 74, 109

DIAGNOSIS.—The species is rather similar to *opacella* in most respects, but is easily distinguished by the white trace on forewing vein A_2.

DESCRIPTION.—Frons conical, scales solid light brown; labial palpi with basal segments white, second segments reddish brown on outer sides, third segments brown on outer sides, both white on inner sides; maxillary palpi moderately small, not approaching frons; antennae light brown, male laminate; occiput behind eye, patagia, and tegulae light brown, vertex behind antennae brownish white; legs white, tarsi light brown.

Forewings reddish orange anterior to cell; ground terra cotta; costa and all other veins traced with white, trace of A_2 bordered with dark brown, cubitus bordered posteriorly with dark brown line. Hindwings light brown, darker toward apex. Venation as in *tetradella*.

Male genitalia with gnathos bearing apical digitate projection. Juxta V-shaped. Valvae with costa sparsely setose, bearing poorly developed apical tooth; sacculus with numerous fine hairs. Aedeagus with vesica bearing a single serrate cornutus.

Female unknown.

TYPES.—In the Canadian National collection (holotype); in the American Museum of Natural History (one paratype), in the Carnegie Museum (two paratypes), in the collection of Charles P. Kimball (one paratype).

TYPE DATA.—Holotype, male, Volusia County, Fla., Aug. 2, 1956, H. A. Denmark; C.N.C. Type No. 9439; genitalia slide No. 412, J. Shaffer, Mar. 15, 1965.

Paratypes: One male, Summer Haven, St. Johns County, Fla., May 30, 1950 (Fred H. Rindge) [AMNH]; one male, Pellicer Cr., 13 mi. north of Bunnell, Flagler County, Fla., Apr. 11, 1954 (J. Bauer), Carnegie Museum Acc. 17023; one male, Apr. 22, 1954, genitalia slide No. 521, J. Shaffer, May 2, 1965; one male, same data as holotype, abdomen lost [CPK].

OTHER SPECIMENS EXAMINED.—15 ♂.

DISTRIBUTION (Map 10).—Known only from the east coast of Florida.

UNITED STATES: FLORIDA: Indian River Co., Vero Beach, 13 ♂, April 1941 (J. R. Malloch), USNM; 1 ♂, May 1941; 1 ♂, Nov. 15-Dec. 31, 1941.

DISCUSSION.—This form has its closest affinities to *opacella*, and differs mainly in size and in that the valvae are rounded and lack the

pointed apex of that species. The most obvious distinctions are those of size, *floridella* having an alar expanse of 25 mm to 28 mm in the specimens examined, contrasted with about 18 mm to 22 mm for *opacella*, and maculation, the forewing veins all showing a prominent white trace in the former species. In *opacella* the white trace is less distinct and essentially absent on A_2. The maxillary palpi are moderately short in the Florida species, not nearly attaining the frons as in *opacella*, and the frons itself is clothed with white-tipped brown scales in the latter species rather than the solid brown scales of *floridella*.

***Peoria rostrella* (Ragonot), new combination**

FIGURES 2, 75, 110, 148

Saluria rostrella Ragonot, 1887, p. 18; 1889, p. 117. — Hulst, 1890, p. 211. — Smith, 1891, p. 85. — Ragonot, 1901, p. 363. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36.

DIAGNOSIS.—The combination of reddish-brown forewings, veins traced with white, R_2 well stalked with R_{3+4}, and M_2 well stalked with M_3 identify this from within the genus.

DESCRIPTION.—Frons conical, reddish brown; labial palpi with basal segments white, second and third segments brown on outer sides, light brown on inner sides; maxillary palpi cylindrical, reaching frons, light brown; antennae light reddish brown, subserrate in male, cilia about one-half as long as segment width; occiput, patagia, and tegulae reddish brown, vertex somewhat lighter.

Forewings reddish brown; all veins traced with white, A_1 traced on distal third; 11 veins; R_2 well stalked with R_{3+4}; M_2 well stalked with M_3. Hindwings with 7 veins; Sc and Rs stalked; M_3 stalked with Cu_1 for about one-half its length.

Male genitalia with gnathos bearing well-developed medial digitate process. Juxta U-shaped. Valvae with costa unarmed. Aedeagus with vesica bearing a single small serrate cornutus.

TYPE.—In the Muséum National d'Histoire Naturelle.

TYPE DATA.—Lectotype male, hereby designated, genitalia slide No. 552, J. Shaffer, July 28, 1965. The type locality is given in the original description as California.

OTHER SPECIMENS EXAMINED.—4 ♂, 1 ♀.

DISTRIBUTION (Map 6).—Washington southward to central California.

UNITED STATES: CALIFORNIA: Sonoma Co., Forestville, 1 ♂, July 10, 1935 (E. C. J.) [CNC]; Tuolumne Co., Twain Harte, 1 ♀, Aug. 18, 1960 (M. Lundgren) [UCB]; 1 ♂, July 20, 1961.

WASHINGTON: Grant Co., Dry Falls, 1 ♂, June 30, 1949 (E. C. Johnston) [CNC]; county unknown, Berne, 1 ♂, July 12, 1942 (E. C. Johnston) [CNC].

Discussion.—The forewing color and maculation is very similar to that of *P. johnstoni*.

Peoria gemmatella (Hulst), new combination

Figures 7, 76, 111, 149

Spermatophthora gemmatella Hulst, 1887, p. 134. — Rindge, 1955, p. 163.
Cayugag emmatella Hulst, 1888, p. 116; 1890, p. 209. — Smith, 1891, p. 84.—Hulst, 1902, p. 438.
Poujadia gemmatella (Hulst).—Ragonot, 1889, p. 117.
Cayuga bistriatella Hulst, 1890, p. 209. — Smith, 1891, p. 84. — Rindge, 1955, p. 158. [New synonymy.]
Pectinigeria gemmatella (Hulst).—Ragonot, 1901, pp. 356–357. — Barnes and McDunnough, 1917, p. 149. — Forbes, 1923, p. 638. — McDunnough, 1939, p. 35.
Pectinigera [sic] *bistriatella* (Hulst). — Dyar, 1908, pp. 117–118.
Pectinigera [sic] *pamponerella* Dyar, 1908, p. 117. [New synonymy.]
Pectinigeria bistriatella (Hulst).—Barnes and McDunnough, 1917, p. 149.—McDunnough, 1939, p. 35. — Kimball, 1965, p. 250.
Pectinigeria pamponerella Barnes and McDunnough, 1917, p. 149.—McDunnough, 1939, p. 35.
Prophtasia bistriatella (Hulst.) — Hampson, 1918, p. 106.
Saluria gemmatella (Hulst). — Hampson, 1918, p. 100.

Diagnosis.—This species is distinguished within the genus by the stalked veins M_{2+3} coupled with the presence of two (subequal) cornuti in the vesica of the male.

Description.—Frons conical, orange red; labial palpi with basal segments light reddish brown to white, second and third segments coral red on outer sides, light brown ventrally; maxillary palpi small, inconspicuous; antennae with scape coral red anteriorly and on inner side, white posteriorly and on outer side, shaft brown, red toward base, laminate in male; lateral regions of occiput, patagia, and tegulae orange red, vertex white behind antennae.

Forewings brownish red; Sc, R_1, and R_2 white traced; R_3, R_4, and M_1 black traced; A_2 white traced; M_3 and cubitals traced with varying mixtures of brown, pink, and white; A_1 orange traced; cell variable, often with more brown or orange than other areas; 11 veins; R_2 free from cell; M_{2+3} stalked. Hindwings light brown, darker in apical area; 7 veins; M_3 and Cu_1 stalked.

Male genitalia with gnathos bearing short apical digitate projection, sometimes very short or absent. Juxta V-shaped. Valvae with costa bearing blunt tooth at apex, sparsely setose; sacculus minutely pubescent. Aedeagus with vesica bearing pair of subequal cornuti, smaller one serrate and more heavily sclerotized.

Female genitalia with ovipositor tip moderately setose, caudal margin finely setose. Posterior apophyses with base somewhat curved, spear-shaped; anterior very gradually thickened toward base.

TYPES.—*S. gemmatella* and *C. bistriatella*, in the American Museum of Natural History; *P. pamponeralla*, in the U.S. National Museum.

TYPE DATA.—*S. gemmatella*, lectotype male, hereby designated, Illinois, collection G. D. Hulst, genitalia slide No. 3223, Carl Heinrich, June 14, 1946; *bistriatella*, lectotype male, hereby designated, Colorado, collection G. D. Hulst, genitalia slide No. 3224, Carl Heinrich, June 14, 1946; in the original description Hulst gives as locality and date: "Taken at San Bernardino, S. Cal., the last week in June"; *pamponerella*, lectotype male, hereby designated, Chimney Gulch, Golden, Colo., Aug. 12, 1907, Oslar; USNM 11854; genitalia slide No. 565, J. Shaffer, Nov. 23, 1965; lectoparatype: one male, same data as lectotype except no genitalia slide, F. Haimbach coll., Lot No. 72, Brackenredge Clemens Memorial collection, in the Academy of Natural Sciences, Philadelphia.

SPECIMENS EXAMINED.—47 ♂, 10 ♀

DISTRIBUTION (Map 6).—Colorado east to Iowa, Illinois, southern Ontario, New Jersey, northward along coast to Maine.

UNITED STATES: Connecticut: New Haven Co., East River, 1 ♀, July 13, 1909 (Charles R. Ely) [USNM]; 1 ♂, Aug. 12, 1909; 1 ♂, August 1911; 1 ♂, July 10, 1912.

ILLINOIS: Cook Co., Arlington Heights, 1 ♂, July 18, 1934 (A. L. McElhose) [CNHM]; 1 ♀, Aug. 15, 1936; Chicago, 1 ♀, Aug. 5, 1916 (E. Beer) [CNHM]; Macon Co., Decatur, 1 ♂, Aug. 1, 1890 (W. Barnes) [USNM]; Hancock Co. Webster, 1 ♂, Aug. 12, 1883 [USNM].

INDIANA: Lake Co., Hessville, 1 ♀, July 15, 1905 (A. Kwiat) [CNHM]; 1 ♂, Aug. 1, 1908 (E. Beer) [CNHM].

IOWA: Story Co., Ames, 1 ♂, June 27, 1912 (G. C. Decker) [USNM]; 1 ♂, July 17, 1932; 1 ♀, August [USNM]; Woodbury Co., Sioux City, 1 ♂, June 25, 1936 (C. N. Ainslie) [UM].

MAINE: York Co., Kennebunk, 1 ♂, Aug. 11, 1901 (G. H. Clapp) [CM]; 1 ♂, Aug. 22, 1901.

MASSACHUSETTS: Nantucket Co., Nantucket, 1 ♂, July 21, 1945 (C. P. Kimball) [CPK]; Barnstable Co., Barnstable, 1 ♂, Aug. 19, 1952 (C. P. Kimball) [CPK]; Woods Hole, 3 ♂, August 1917 (W. T. M. Forbes) [CU]; Plymouth Co., Agric. Exp. Sta., East Wareham, 1 ♂, Aug. 7, 1964 [CPK]; 1 ♂, Aug. 22, 1964.

NEW JERSEY: Burlington, Brown's Mills, 1 ♂, August 31, (F. H. Benjamin) [CU]; New Libson, 1 ♂, June 12, 1942 (E. P. Darlington) [ANS]; 1 ♂, Aug. 4, 1942; Whitesbog, 1 ♂, June 22, 1940 (E. P. Darlington) [ANS]; 1 ♂, Aug. 5 1940; 1 ♂, Sept. 19, 1936; Ocean Co., Lakehurst, 1 ♀, Aug. 30, 192? (F. M. Schott) [USNM]; Lakehurst, Wrangle Brook Rd., 2 ♂, June 27, 1954 (J. G. Franclemont) [JGF]; 2 ♂, June 27, 1955; 1 ♂, Aug. 9, 1955.

NEW YORK: Suffolk Co., Orient, 1 ♂, July 16, 1932 (Roy Latham) [CU]; 1 ♂, Apr. 21, 1935 [AMNH]; 1 ♀, June 14, 193?, [CU]; 1 ♀, July 3, 1945; 1 ♀, Sept. 4, 1945; 1 ♂, Sept. 16, 1945; 1 ♂, July 7, 1947 [AMNH]; 2 ♂, Aug. 17, 1947; 1 ♂, no date [CNC].

CANADA: ONTARIO: Kent Co., Chatham Lab., 1 ♂, Aug. 28, 1932 [CNC]; 1 ♂, July 12, 1934; 1 ♂, July 18, 1934; 1 ♂, July 20 ,1935.

Locality unknown: Edgebrook (Prob. Cook Co., Illinois), 1 ♂, July 8, 1911 (A. Kwiat) [USNM].

2 ♂, no date, [INHS]; 2 ♂, 1 ♀, no date [USNM].

Peoria roseotinctella (Ragonot), new combination

Figures 10, 61, 77, 112, 150

Statina roseotinctella Ragonot, 1887, p. 19; 1889, p. 117. — Hulst, 1890, p. 216 — Smith, 1891, p. 85. — Ragonot, 1901, p. 416. — Hulst, 1902, p. 440. — Barnes and McDunnough, 1917, p. 150. — Grossbeck, 1917, p. 134. — Hampson, 1918, p. 60. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

Calera punctilimbella Ragonot, 1888, p. 50. — Hulst, 1890, p. 217. — Smith, 1891, p. 85. — Ragonot, 1901, pp. 417–418. — Hulst, 1902, p. 441. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 59. — Forbes, 1923, p. 639. — McDunnough, 1939, p. 36. [New synonymy.]

Statina bifasciella Hampson *in* Ragonot, 1901, pp. 416–417. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 60. — McDunnough 1939, p. 36. [New synonymy.]

Diagnosis.—The transverse posterior line of dots on the forewing veins delimits this species within the genus.

Description.—Frons conical, deep red, often brown laterally; labial palpi with basal segments white, second and third segments deep red on outer sides, ventral third lighter, dorsal third often brown; maxillary palpi moderately small; antennae with scape deep red on inner side, white on outer side, shaft light brown, pink near base, laminate in male; occiput, patagia, tegulae, vertex, and dorsum of thorax deep red; legs pink on outer sides, light brown on inner sides, tarsi often brown.

Forewings orange red, mixed with white anterior to cell; Sc and Rs sometimes white traced, Rs often bordered posteriorly by a broad line of scattered black scales extending from base to apex; transverse posterior indicated by black spots on Rs, M_1, M_3, Cu_1, Cu_2, and A_2; terminal line indicated by dark spots on M_3, Cu_1, Cu_2, and A_1 fold; terminal spots visible on lower surface of wing; 10 veins; R_2 stalked with R_{3+4}, M_2 fused with M_3; M_3 stalked with Cu_1. Hindwings with 6 veins; M_3 and Cu_1 completely fused.

Male genitalia with medial process of uncus bearing small apical bulge. Gnathos weakly sclerotized, without apical or lateral processes, occasionally with very short apical process. Juxta U-shaped. Valvae with costa sparsely setose, terminating in a dorsally directed hook; sacculus densely pubescent. Aedeagus with vesica bearing equal pair of finely serrate cornuti.

Female genitalia with ovipositor moderately setose laterally, caudal margin with numerous fine setae. Posterior apophyses straight, base flat and spearlike; anterior curved, tapering gradually to slightly thickened base.

TYPES.—*S. roseotinctella*, in the Museum National d'Histoire Naturelle; *C. punctilimbella*, in the Zoologisches Museum der Humbolt-Universität, Berlin; *S. bifasciella*, in the British Museum (Natural History).

TYPE DATA.—*S. roseotinctella*, lectotype male, hereby designated, Florida, genitalia slide No. 539, J. Shaffer, June 20, 1965.

C. punctilimbella, lectotype female, hereby designated, Carolina; genitalia slide No. 818, J. Shaffer, Mar. 20, 1967.

S. bifasciella, lectotype female, hereby designated, labeled as follows: "11/9; Type; Belfrage Texas 1869; Stainton Coll. 93—134.; Statina bifasciella type ♀ Hmpsn; ♀ genitalia slide I–4–1967 J. Shaffer No. 702."

SPECIMENS EXAMINED.—57 ♂, 25 ♀.

DISTRIBUTION (Map 6).—Kansas and eastern Texas to Florida, southern Florida north to New Jersey.

UNITED STATES: ALABAMA: Macon Co., LaPlace near Tuskeege, 4 ♂, June 9, 1917 [CU].

DISTRICT OF COLUMBIA: Washington, 1 ♀, June 1902 (Aug. Busck) [USNM].

FLORIDA: Alachua Co., Gainesville, 1 ♀, June 2, 1927 (J. Speed Rogers) [CU]; 1 ♂, June 3, 1927; 1 ♀, June 29, 1927; 1 ♂, July 7, 1927; 13 ♂, July 8, 1927; 3 ♂, July 10, 1927; 3 ♂, July 1927; 1 ♀, Apr. 24, 1952 (O. Peck) [CNC]; 1 ♂, Sept. 3, 1956 (H. A. Denmark) [CPK]; no locality, 1 ♂, Sept. 13, 1956 (H. A. Denmark) [CPK]; Dade Co., Homestead, 1 ♀, Aug. 7, 1963 (D. O. Wolfenbarger) [CPK]; 1 ♂, Mar. 10, 1964; 1 ♂, 1 ♀, Sept. 29, 1964; Princeton, 1 ♀, Apr. 4, 1952 (J. R. Vockeroth) [CNC]; Escambia Co., Pensacola, 1 ♂, May 22, 1961 (Shirley Holls) [CPK]; Hernando Co., Weeki Wachee Springs, 1 ♂, May 28, 1960 (J. F. May) [CPK]; Highlands Co., Archbold Biol. Sta., 1 ♂, June 27, 1964 (Jay C. Shaffer) [JCS]; Hillsborough Co., Stemper, 1 ♂, Aug. 19, 1912 (G. Krautwurm) [CM]; 1 ♂, Sept. 1 1912; 1 ♂, Sept. 6, 1912; 1 ♂, Oct. 3, 1912; 1 ♂, Oct. 6, 1912; 2 ♂, Oct. 30, 1912; Manatee Co., Oneco, 1 ♂, Aug. 3, 1953 (Paula Dillman) [CPK]; 1 ♂, Mar. 28, 1957 (J. G. Franclemont) [JGF]; Orange Co., Orlando, 1 ♂, June 29, 1927 (C. C. McBride) [CU]; 1 ♂, July 24, 1927; Winter Park, 1 ♀, July 4, 1942 (H. T. Fernald) [USNM]; Volusia Co., Cassadaga, 1 ♂, Oct. 18, 1963 (S. V. Fuller) [CPK]; Wakulla Co., Panacea, 2 ♂, Aug. 11, 1926 (C. O. Handley) [USNM].

GEORGIA: Bryan Co., Clyde, 1 ♂, Sept. 11–12, 1931 (Bradley and Knorr) [CU].

KANSAS: Riley Co., Manhattan, 1 ♀, June 11, 1933 (H. L. Nonamaker) [KSU].

LOUISIANA: Vernon Ph., 1 ♀, August (G. Coverdale) (USNM].

MISSISSIPPI: Forrest Co., Camp Shelby, 3 ♂, 2 ♀, Oct. 1–15, 1944 (C.D. Michener) [AMNH]; Hinds Co., Clinton, 1 ♀, June 12, 1960 (Bryant Mather) [BM].

NEW JERSEY: Ocean Co., Lakehurst, Wrangle Brook Rd., 1 ♂, June 30, 1965 (Jay C. Shaffer) [JCS].

NORTH CAROLINA: Polk Co., Tryon, 1 ♂, Aug. 8, 1904 (Fiske) [USNM]; 2 ♂, Aug. 9, 1904; 1 ♂, Aug. 10, 1904; 1 ♂, Aug. 11, 1904; 1 ♂, no date.

SOUTH CAROLINA: Oconee Co., Cherry Hill Rec. Area, Route 107 (2000 ft.), 1 ♂, Aug. 22, 1958 (J. G. Franclemont) [JGF].

TENNESSEE: Knox Co., Knoxville, 1 ♀, June 26, 1916 (G. G. Ainslie), [USNM]. TEXAS: Blanco Co., 1 ♀, no date [USNM]; Liberty Co., Devers, 1 ♂, 2 ♀, June 21, 1917 [CU]; Nueces Co., Corpus Christi, 6 ♀, Sept. 25-Oct. 15, 1943 (W. M. Gordon) [CU].

Peoria johnstoni, new species

FIGURES 1, 78, 113, 151

DIAGNOSIS.—Among the three other species of *Peoria* with similar venation, *johnstoni* differs from *approximella* and *luteicostella* in lacking a well-developed white band anterior to the cell, and from *bipartitella* in having the forewings a rather uniform brownish orange. Either the presence of two cornuti on the vesica of the aedeagus or the absence of medial or lateral processes on the gnathos will delimit males of *johnstoni* from the above three species.

DESCRIPTION.—Frons conical, reddish brown; labial palpi with basal segments white, second and third segments reddish brown dorsally and on outer sides, lighter ventrally and on inner sides; maxillary palpi small; antennae light brown, scape light pink anteriorly, male subserrate; occiput, patagia, and tegulae reddish brown, vertex somewhat lighter.

Forewings brownish orange; Sc, radials, cubitals, M_3, and A_2 white traced, costa traced with narrow inconspicuous white line; brownish orange on lower surface. Venation as in *P. bipartitella*.

Male genitalia with medial process of uncus bearing small ventral bulge at apex. Gnathos weakly sclerotized, without apical or lateral processes. Juxta U-shaped. Valvae with costa sparsely setose; sacculus densely setose. Aedeagus with vesica bearing pair of ovate subserrate cornuti.

Female genitalia with ovipositor moderately setose along caudal margin. Posterior apophyses straight, base flat and shaped like parallelogram with short side horizontal; anterior slightly curved, tapering gradually to thickened base.

TYPE.—In the Canadian National collection.

TYPE DATA.—Holotype, male, Fort Davis, Jeff Davis County, Tex., May 20, 1950, E. C. Johnston; C.N.C. Type No. 9440; genitalia slide No. 591, J. Shaffer, Mar. 24, 1966.

Paratypes: Five males, same data as holotype, no genitalia slides prepared.

SPECIMENS EXAMINED.—16 ♂, 15 ♀.

DISTRIBUTION (Map 7).—Mexican Highland Province; southern Arizona and New Mexico to southwestern Texas.

UNITED STATES: ARIZONA: Pima Co., Baboquivari Mts., 3 ♀, Sept. 1–15, 1923 (O. C. Poling) [USNM]; 1 ♀, Oct. 1–15, 1923; 1 ♀, Apr. 15–30, 1924; 3 ♂ 2 ♀, Oct. 1–15, 1924; 1 ♂, 2 ♀, Oct. 15–30, 1924; Pinal Co., Oracle, 1 ♂, June 5,

1935 (Grace H. and John L. Sperry) [AMNH]; Santa Cruz Co., Pena Blanca (3950 ft.), 1♂, May 31, 1963 (J. G. Franclemont) [JGF]; county unknown (southeastern Arizona), Huachuca Mts., 1♂, June 1, 1935 (J. A. Comstock) [CNC]; 1♀, May 28, 1935 (Grace H., and John L. Sperry) [CNC]; 1♀, June 1, 1935 [AMNH].

New Mexico: Eddy Co., White City, 1♂, May 15, 1950 (E. C. Johnston) [CNC].

Texas: Brewster Co., Alpine, 4♀, May 22, 1950 (E. C. Johnston) [CNC]; Jeff Davis Co., Limpia Canyon, 8♂, May 20, 1950 (E. C. Johnston) [CNC].

Peoria santaritella (Dyar), new combination

Figures 5, 79, 114, 152

Ollia santaritella Dyar, 1904, p. 108.—Barnes and McDunnough, 1917, p. 149.—McDunnough, 1939, p. 36.

Diagnosis.—The forewings are white anterior to the cubitus, red between the cubitus and the A_1 fold, and light pink posterior to the fold; the combination of these features serves to delimit the species within the genus.

Description.—Frons conical, blood red; labial palpi with basal segments white, second and third segments red on outer sides, white ventrally and on inner sides; maxillary palpi small; antennae with scape red, shaft brown, male serrate and fasciculate; occiput deep red behind eye, vertex posterior to antennae and dorsal area of occiput white, patagia and tegulae pink; legs white, tarsi light brown, forelegs pink on inner sides.

Forewings white anterior to cubitus, a few scattered red scales anterior to cell, costal margin bordered with red near base; red between cubitus and A_1 fold, bounded distally by M_3 and Cu_2; light pink posterior to red line; underside with red showing through faintly; 10 or 11 veins; R_2 free from cell; M_{2+3} stalked for about half its length or completely fused, both conditions about equally common, sometimes (rarely) differing on right and left wings of same specimen. Hindwings with M_3 and Cu_1 stalked.

Male genitalia with gnathos bearing short apical digitate projection. Juxta V-shaped. Valvae with costa terminating in a blunt tooth, cucculus not projecting beyond costa; sacculus with fine hairs. Aedeagus with vesica bearing single serrate cornutus.

Female genitalia with ovipositor tip sparsely setose, caudal margin with numerous fine setae. Posterior apophyses with base tapering to point, not flattened or broadened, curved near base; anterior tapering gradually to slightly thickened base.

Type.—In the U.S. National Museum.

Type data.—Holotype male, Santa Rita Mountains, Arizona, "7. 6," E. A. Schwarz; USNM 7893; genitalia slide No. 569, J. Shaffer,

Nov. 23, 1965. In the original description Dyar gives the date of capture as June 7.

SPECIMENS EXAMINED.—4 ♂, 21 ♀.

DISTRIBUTION (Map 7).—Northern extension of Sierra Madre Occidental into southeastern Arizona.

UNITED STATES: ARIZONA: Cochise Co., Paradise, Chiricahua Mts., 1 ♀, July 3, 1954 (Cazier and Gertsch) [AMNH]; Southwestern Res. Sta. (5400 ft.), 5 mi. west Portal, 1 ♀, May 28, 1956 (Cazier and Ordway) [AMNH]; 1 ♀, May 25, 1958; 4 ♀, June 11, 1958 (W. J., and J. W. Gertsch) [AMNH]; 2 ♀, June 12, 1958; 1 ♀, June 16, 1958 (M. A. Cazier) [AMNH]; 1 ♀, May 27, 1960 (Carl W. Kirkwood) [CPK]; 1 ♀, June 2, 1960; 1 ♂, May 10, 1961 (Gertsch and Cazier) [AMNH]; Pima Co., Santa Rita Mts., Madera Canyon (4400 ft.), 1 ♀, June 12, 1963 (J. G. Franclemont) [JGF]; Santa Cruz Co., Santa Rita Mts., Madera Canyon (4800 ft.), 1 ♀, June 19, 1960 (David A. Wallesz) [CU]; (5800 ft.), 1 ♀, June 24, 1960; Madera Canyon (4800 ft.), 1 ♂, May 26, 1963 (J. G. Franclemont) [JGF]; 1 ♂, 1 ♀, June 19, 1963; 1 ♀, June 13, 1960; 1 ♀, June 3, 1963; (5600 ft.), 1 ♂, June 11, 1963; 1 ♀, June 18, 1963; Pena Blanca (3950 ft.), 1 ♀, June 7, 1963 (J. G. Franclemont) [JGF]; county unknown, Huachuca Mts., 1 ♀, June 2, 1935 (Grace H., and John L. Sperry) [AMNH].

Peoria holoponerella (Dyar), new combination

FIGURES 3, 4, 80, 115, 153

Ollia holoponerella Dyar, 1908, p. 117. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36.

DIAGNOSIS.—The light buff forewing with its conspicuous white band anterior to the cell delimits this species within *Peoria*. A similar white band marks the forewings of *approximella* and *luteicostella*, but in both of these species the forewings are marked with red and lack vein M_2.

DESCRIPTION.—Frons conical, brown; labial palpi with basal segments white, second and third segments brown on outer sides, light brown to white ventrally and on inner sides; maxillary palpi small; antennae silver, male shaft serrate and fasciculate; occiput behind eye, patagia, and tegulae light brown, vertex and dorsum of occiput white; legs white, tarsi brown.

Forewings with white band anterior to cell, bordered anteriorly near base with dark brown, posteriorly by black line; ground light buff; veins traced with black scales. Hindwings light brown. Venation as in *gemmatella*.

Male genitalia with gnathos bearing medial digitate projection. Juxta V-shaped. Valvae with costa unarmed, bearing scattered setae; sacculus with fine hairs, Aedeagus with vesica bearing single round serrate cornutus.

Female genitalia with ovipositor slender, caudal margin rather heavily setose, bare laterally, Apophyses straight, posterior hooked upward and coming to point at base; anterior with thickened base.

TYPE.—In the U.S. National Museum.

TYPE DATA.—Holotype male, San Bernardino Ranch, Cochise County, Ariz., 3750 ft., August, F. H. Snow; USNM 11855; genitalia slide No. 568, J. Shaffer, Nov. 23, 1965.

SPECIMENS EXAMINED.—18 ♂, 2 ♀.

DISTRIBUTION (Map 7).—Southwestern United States.

UNITED STATES: ARIZONA: Cochise Co., Douglas, 2 ♂, August (F. H. Snow) [UK]; San Bernardino Ranch (3750 ft.), 5 ♂, 1 ♀, August (F. H. Snow) [UK].

CALIFORNIA: Inyo Co., Furnace Creek, Death Valley, 3 ♂, Apr. 21, 1942 (George Willett) [LACM]; Triangle Springs, Death Valley, 1 ♀, Apr. 14–15, 1942 (George Willett) [LACM]; 1 ♂, Apr. 17, 1942.

NEW MEXICO: Sandoval Co., Jamez Springs (6200 ft.), 4 ♂, July 16, 1950 (T. Cohn, P. Boone, M. Cazier) [AMNH].

TEXAS: Jeff Davis Co., Limpia Canyon, 2 ♂, May 20, 1950 (E. C. Johnston) [CNC].

UTAH: Locality unknown, 1 ♂, July 1900 (Poling) [USNM].

DISCUSSION.—The five specimens from Death Valley entirely lack brown or black markings on the forewings.

Peoria approximella (Walker)

FIGURES 14, 59, 81, 116, 154

Eurhodope approximella Walker, 1866, p. 1722.
Anerastia haematica Zeller, 1872, pp. 555–556. — Grote, 1879, p. 12, pl. 2, fig. 14
Nephopteryx roseatella Packard, 1873, p. 270.
Peoria haematica (Zeller). — Ragonot, 1889, p. 117. — Hulst, 1890, pp. 213–214. — Smith, 1891, p. 85.
Peoria approximella (Walker). — Ragonot, 1901, p. 386. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — Grossbeck, 1917, p. 134. — Forbes, 1923, p. 638. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.
Hypsotropa approximella (Walker). — Hampson, 1918, p. 77.
Hypsotropa cremoricosta Hampson, 1918, p. 74. — McDunnough, 1939, p. 36. [New synonymy.]

DIAGNOSIS.—The presence of both a prominent white band anterior to the cell and a fainter one posterior to vein A_2 marks this species as distinct within the genus. The gnathos is also unique in that it bears a pair of short lateral finger-like processes.

DESCRIPTION.—Frons conical, blood red to orange red; labial palpi with basal segments varying white to light pink, second and third segments somewhat rough scaled, blood red to orange red dorsally and on outer sides, usually paler ventrally and on inner sides; maxillary palpi small; antenna with scape red on anterior and inner sides, light pink to white on posterior and outer sides, shaft light brown, pink toward base, laminate in male; occiput laterally, patagia, and tegulae orange red, vertex light brown to white.

Forewings with broad white band anterior to cell, narrowing to point just short of apex, bordered anteriorly with black near wing

base, bordered posteriorly with black, fading into blood red triangular area extending to anal vein; brownish white posterior to anal vein; anal and costal bands joined near wing base; fringe white. Venation as in *bipartitella*.

Male genitalia with gnathos weakly sclerotized, bearing pair of short, lateral, subapical projections. Juxta scoop-shaped. Valvae with costa terminating in free spine not attaining apex of bluntly rounded cucculus; sacculus minutely pubescent. Aedeagus with vesica unarmed.

Female genitalia with ovipositor tip moderately setose, caudal margin with numerous fine setae, sparsely setose laterally. Apophyses uniform, curved at base; posterior tapering to point at base, base not flattened.

Types.—*E. approximella*, *A. haematica*, and *H. cremoricosta* in the British Museum (Natural History); *N. roseatella*, in the Museum of Comparative Zoology (Harvard University).

Type data.—*E. approximella*, Walker reports: "North America. From Mr. Carter's collection." Type examined by Mr. Paul Whalley.

A. haematica, Zeller in his description noted: ". . . New York und aus Massachusetts . . . ." Type examined by Mr. Paul Whalley.

N. roseatella, two specimens, both from Massachusetts, and both Type No. 14282, one from Dorchester, the other hereby designated as lectotype and labeled male genitalia slide No. 540, J. Shaffer, June 24, 1965. In his description Packard indicated that he had two males and noted: "Length of fore wing .37 of an inch. Dorchester, Mass. (F. G. Sanborn)."

H. cremoricosta, lectotype male, hereby designated, labeled as follows: "Type; Colorado Springs, Colorado. 97–278 June–Aug 1896; Hypsotropa cremoricosta type ♂. Hmpsn.; ♂ genitalia slide I–4–1967 J. Shaffer No. 703."

Specimens examined.—562 ♂, 302 ♀.

Distribution (Map 5).—Southern Canada west to Alberta, southward in mountains to Utah and New Mexico, east to Tennessee and Georgia, north to Nova Scotia; absent from Florida and the Gulf Coastal Plain.

UNITED STATES: Colorado: El Paso Co., Rock Creek Canyon, Colorado Springs, 2 ♂, Aug. 10, 1957 (Margot May) [CPK]; 1 ♂, Aug. 13, 1957; 4 ♂, Aug. 14, 1957; 1 ♂, Aug. 23, 1957; 2 ♂, June 27, 1960; 1 ♂, June 28, 1960; 1 ♂, July 15, 1960; 1 ♂, July 9, 1961; 1 ♂, July 19, 1961; 6 ♂, June 30, 1963; 2 ♂, July 1, 1963; 1 ♂, July 3, 1963; 2 ♂, July 14, 1963; 1 ♂, July 17, 1963; 1 ♂, July 18, 1963; 1 ♂, Aug. 11, 1963; 1 ♂, June 27, 1964; 3 ♂, June 28, 1964; vic. Colorado Springs, 1 ♀, July 7, 1939 [AMNH]; Jefferson Co., Chimney Gulch, Golden, 1 ♂, Sept. 3, 1908 (Oslar) [ANS]; Larimer Co., Estes Park, 1 ♂, Aug. 29, 1936 (Grace H. and John L. Sperry) [AMNH]; Teller Co., Big Springs Ranch, Florissant, 1 ♂, July 13, 1960 (Thomas C. Emmel) [LACM]; 1 ♂, July 21, 1960; 2 ♂, July 23, 1960; 2 ♂, July 26, 1960; 1 ♂, July 29, 1960; 1 ♂, July 30, 1960; 1 ♂, July 31, 1960; 2 ♂, Aug. 2, 1960; 1 ♂, Aug. 3, 1960, 1 ♂, Aug. 4, 1960; 1 ♂, Aug. 8, 1960;

1 ♂, Aug. 11, 1960; 1 ♂, Aug. 12, 1960; 1 ♂, Aug. 14, 1960; locality unknown, 1 ♂, no date [AMNH].

Connecticut: Windham Co., South Shore, Killingly Pd., 1 ♀, July 25, 1930 (A. B. Klots) [AKB]; Putnam, 1 ♂, Aug. 14, 1954 (A. B. Klots) [ABK]; 1 ♂, July 1, 1960; 1 ♀, July 20–25, 1961; 1 ♀, July 25–30, 1961.

District of Columbia: 1 ♂, Aug. 17, 1899 (August Busck) [USNM]; 2 ♀, July 1901; 2 ♀, June 1902; 1 ♀, June 1907; 1 ♀, June.

Georgia: Charlton Co., 1 ♀, June 14, 1946 (Otto Buchholz) [ANS].

Illinois: Cook Co., Arlington Heights, 1 ♂, June 20, 1930 (A. L. McElhose) [CNHM]; 1 ♀, June 23, 1930; 1 ♀, June 24, 1930; 1 ♀, July 29, 1930; Chicago, 3 ♂, June 1900 [USNM]; 1 ♀, July 14, 1904; 1 ♂, July 8, 1906 (W. J. Gerhard) [CNHM]; 1 ♂, June 1912 (A. Kwiat) [CNHM]; Jackson Co., Murphysboro, 1 ♀, Aug. 10, 1932 (W. J. Gerhard) [CNHM]; McHenry Co., Algonquin, 1 ♂, July 6, 1903 (W. A. Nason) [INHS]; 1 ♀, July 16, 1904; 1 ♂, June 8, 1906; McLean Co., Normal, 1 ♀, June 19, 1884 [INHS]; Macon Co., Decatur, 1 ♂ June 8–15 (Barnes) [USNM]; Putnam Co., 1 ♂, May 31, 1934 (M. O. Glenn) [MOG]; 1 ♂, June 21, 1954; 1 ♂, Sept. 5, 1955; 1 ♂, June 8, 1959; 1 ♀, July 19, 1962; 1 ♀, June 25, 1964; 1 ♀. July 15, 1964; Magnolia, 1 ♂, June 29, 1932 (Murray O. Glenn) [USNM]; locality unknown, 2 ♂, no date [USNM].

Indiana: Lake Co., Hessville, 1 ♂, May 14, 1905 (A. Kwiat) [CNHM]; 1 ♂, June 17, 1905; 1 ♂, June 17, 1912.

Iowa: Johnson Co., Iowa City, 1 ♀, July 12, 1898 (Wickham) [AMNH]; 1 ♀, July 27, 1898; Story Co., Ames, 1 ♂, July 9, 1915 (G. G. Ainslie) [USNM]; Woodbury Co., Sioux City, 1 ♀, July 23, 1923 (C. N. Ainslie) [UM]; locality unknown, 1 ♂, no date (C. P. Gillette) [USNM].

Kansas: Pottawatomie Co., Onaga, 1 ♂, June 17, 1901 (Crevecoeur) [KS]; 1 ♂, July 7, 1901; Riley Co., 1 ♂, June 22 (F. Marlatt) [KS]; 1 ♀, July; 1 ♂, July 28.

Kentucky: Rockcastle Co., 1 ♂, June 24, 1955 (R. Beebe) [CNC].

Maine: Franklin Co., Rangeley, 1 ♂, June 23, 1938 (V. H. dos Passos) [AMNH]; 1 ♂, July 9, 1938; Knox Co., Rockport, 1 ♂, July 10, 1941 (Morgan Hebard) [ANS]; Penobscot, Orono, 2 ♀, no date, [CU]; York Co., Kennebunkport, 2 ♂, 1 ♀, July (G. H. Clapp) [CM]; 3 ♂, 1 ♀, August.

Maryland: Montgomery Co., Plummer Isl., 1 ♀, May 1903 (August Busck) [USNM]; 1 ♂, June 1903; 1 ♀, Aug. 2, 1905 (H. S. Barber) [USNM]; 2 ♀, Aug. 8, 1905 (Barber and Schwarz) [USNM]; Prince Georges Co., Beltsville, 1 ♂, June 10, 1939 (L. J. Bottimer) [ANS].

Massachusetts: Barnstable Co., Woods Hole, 1 ♀, August 1917 (W. T. M. Forbes) [CU]; Barnstable, 1 ♂, July 5, 1949 (C. P. Kimball) [CPK]; 1 ♂, July 6, 1949; 4 ♂, July 7, 1949; 1, June 24, 1958; 1 ♂, Aug. 1, 1958; 1 ♀, June 18, 1962; West Barnstable, 3 ♂, July 15, 1949 (C. P. Kimball) [CPK]; 1 ♂, July 16, 1949; Dukes Co., Martha's Vineyard, 1 ♂, June 17, 1931 (F. M. Jones) [ANS]; 1 ♀, July 22 [CPK]; Essex Co., Magnolia, 1 ♂, June 29, 1900 (Holland) [CM]; Hampden Co., Chicopee, 1 ♀, no date (F. Knab) [USNM]; Nantucket Co., Nantucket, 1 ♂, July 9, 1941 (C. P. Kimball) [CNC]; Plymouth Co., Agric. Exp. Sta., East Wareham, 2 ♂, Aug. 7, 1961 [CPK]; 1 ♂, July 3, 1962; 1 ♂, July 19, 1962; 1 ♂, Aug. 17, 1964; 1 ♂, Aug. 18, 1964; 1 ♂, Aug. 20, 1964; Suffolk Co., Arlington, 1 ♂, June 25, 1920 (C. S. Anderson) [BPI]; Boston, 1 ♀, no date [AMNH]; Worcester Co., Paxton, 2 ♂, July 3, 1945 (W. T. M. Forbes) [CU]; locality unknown, 1 ♂, June 27, 1868 (BM, ex Zeller coll.].

Michigan: Kalamazoo Co., Gull Lake Biol. Sta., 1 ♀, July 21, 1959 (Roland L. Fischer) [CNC].

Minnesota: Cass Co., 1♂, June 29, 1937 (L. W. Orr), [UM]; 1♂, June 30, 1937; 1♂, July 2, 1937; 1♂, July 11, 1937; Cass Lake, 1♂, June 18, 1934 (A. A. Granovsky) [UM]; 1♀, July 17, 1936 (R. H. Daggy) [UM]; 1♂, Aug. 3, 1936; 1♂, Aug. 14, 1936; Hennepin Co., Saint Anthony Park, 1♀, July 12, 1900 [UM]; Olmsted Co., 1♀, no date [UM]; Polk Co., Crookston, 1♂, July 18, 1935 (D. G. Denning) [UM]; 1♂, June 27, 1937; 1♂, July 4, 1937; 1♂, July 23, 1939 (A. W. Buzicky) [UM]; Crookston, Red Lake River, 1♂, July 9, 1935 (D. G. Denning) [UM]; Pope Co., Sedan, 1♂, July 7, 1927 (D. Denning) [UM]; Ramsey Co., St. Paul, 1♂, July 21, 1927 (Carl T. Schmidt) [UM]; county unknown, Itasca Park, LaSalle Valley, 1♂, June 21, 1940 (C. E. Mickel) [UM]; 1♂, June 23, 1940; 1♂, June 24, 1940; 1♂, July 7, 1940; 2♂, 1♀, July 9, 1940; 1♂, July 12, 1940; 1♂, July 14, 1940.

Missouri: Clinton Co., Lathrop, 1♀, June 22, 1955 (E. C. Becker) [CNC]; city of St. Louis, 5♂, 5♀, June 1904 (August Busck) [USNM]; 1♂, July 1904; 1♂, 1♀, Aug. 6, 1906 (McElhose) [CNHM].

Nebraska: Sioux Co., Canon region north of Harrison, 4♂, July 19, 1917 (R. A. Leussler) [USNM, AMNH].

New Hampshire: Coos Co., Randolph, 1♀, Aug. 16, 1936 (Grace H. and John L. Sperry) [AMNH]: Grafton Co., Franconia, 2♂, no date [AMNH]; Rockingham Co., Hampton, 1♂, June 27, 1913 (S. Albert Shaw) [USNM]; 1♀, July 18, 1914.

New Jersey: Bergen Co., Bergenfield, 1♀, July 3 (F. M. Schott) [AMNH]; Oakland, 1♀, July 25, 1947 (C. P. Kimball) [CPK, CNC]; 1♀, July 26, 1947; 1♀, July 27, 1947; 1♂, Aug. 8, 1948; 1♂, Aug. 9, 1948; Aug. 10, 1948; 1♂, Aug. 12, 1948; 1♂, Aug. 13, 1948; Ramsey, 1♂, 3♀, July 12, 1935 [AMNH]; 1♂, July 29, 1935 [AMNH]; Burlington Co., New Lisbon, 1♂, July 14, 1930 (E. P. Darlington) [ANS]; 1♂, July 1, 1932; 1♀, July 19, 1932; 1♂, July 29, 1931; 1♂, July 20, 1942; Essex Co., Montclair, 1♂, June 15 (W. D. Kearfott) [USNM]; 1♂, July 10; 1♂, July 18; Newark, 1♂, June 13, 1898 [USNM]; Middlesex Co., Dayton, 2♂, June [USNM]; New Brunswick, 1♂, June 11 [AMNH]; 1♂, June 1933 [AMNH]; Monmouth Co., Como, 1♀, July 1919 [AMNH]; Morris Co., Mendham, 1♂, 1♀, June 20, 1934 [AMNH]; Ocean Co., Wrangle Brook Road, Lakehurst, 1♂, June 17, 1955 (J. G. Franclemont) [JGF]; Union Co., Elizabeth, 1♀, "8–13" [CNHM]; county unknown, 1♀, no date [AMNH].

New Mexico: McKinley Co., McGaffey, Zuni Mts. (7500 ft.), 1♂, July 22, 1962 (E. and I. Munroe) [CNC]; 2♂, July 23, 1962; Sandoyal Co., Frijoles Canyon, Bandelier Nat. Mon. (6050 ft.), 1♂, July 18, 1962 (E. and I. Munroe) [CNC]; county unknown, 1♂, June 30, 1935 (Grace H. and John L. Sperry) [AMNH].

New York: Cattaraugus Co., Otto, 1 ♀, July 17, 1882 [CU]; Clinton Co., Peru, 2♂, 1♀, June 21, 1915 [CU]; 1♀, July 1, 1916; 1♂, July 2, 1916 (Mix and Everett) [CU]; Delaware Co., 4♂, Aug. 3, 1962 (Robert Silberglied) [JCS]; 4♂, ♀, Aug. 5, 1962; Erie Co., East Aurora, 1♂, July 20, 1912 (E. Wild) [CU]; North Collins, 1♂, 2♀, June 27, 1939 (W. T. M. Forbes) [CU]; 1♂, June 28–29, 1939; Sardinia, 1♂, July 24, 1940 (L. R. Rupert) [CU]; 1♀, July 27, 1940; Jefferson Co., Picton Island, Clayton, 1♂, June 22, 1958 (B. Heineman) [AMNH]; Lewis Co., 1♂, June (W. W. Hill) [UK]; Monroe Co., 1♀, July 11, 1945 [CNC]; 1, June 27, 1947 [CNC]; 1♀, July 9, 1947 [CNC]; 1♀, July 11, 1947 [CNC]; 1♂, July 21, 1947 [CPK]; 1♀, June 28, 1948 [CNC]; 1♀, June 29, 1948 [CNC]; 1♂, July 1, 1948 [CPK]; Rochester, 1♂, June 26, 1932 [ABK]; New York City, West Farms, 1♀, no date (J. Angus) [AMNH]; Orange Co., Tuxedo, 1♀, June 28, 1928 [AMNH]; 1♀, July 10, 1928 [AMNH]; Oswego Co., Minetto, 1♂, June 19,

1938 (W. T. M. Forbes) [CU]; 2♂, 2♀, June 21, 1938; 3♂, 9♀, June 22, 1938; 2♂, 8♀, June 24, 1938; 1♀, Aug. 22, 1938; Otsego Co., Oneonta, 1♀, July 4, 1935 (H. K. Townes) [CU]; 1♀, July 5, 1935; Saint Lawrence Co., Oswegatchie, 3♂, Aug. 3, 1926 (B. K. Smith) [CU]; Suffolk Co., Flanders, 1♂, Sept. 1, 1946 (Roy Latham) [CU]; Huntington, 1♀, July 25, 1925 (F. M. Schott) [USNM]; Montauk, 1♀, Sept. 8, 1946 (Roy Latham) [CU]; Orient, 1♀, July 28, 1931 (Roy Latham) [CU]; 1♂, July 6, 1932; 1♂, Aug. 3, 1932; 1♀, Aug. 4, 1932; 1♂, Nov. 6, 1932; 1♂, June 22, 1934; 1♂, June 22, 1946 (Roy Latham) [AMNH]; 1♂, June 21, 1947; 1♀, June 23, 1947; 1♂, July 21, 1947; 1♂, June 12, 194?; Shelter Island, 1♀, Sept. 14, 1946 (Roy Latham) [CU]; Southold, 1♀, July 1, 1934 (Roy Latham) [CU]; 1♂, July 24, 1946; Tompkins Co., Ithaca, 2♂, July 4, 1882 [CU]; 3♂, 6♀, July 8, 1882 [CU]; 1♂, July 14, 1885 (E. H. Sargent) [CU]; 1♀, June 13, 1893 [CU]; 1♀, July 7, 1893 [CU]; 1♂, June 1913 [CU]; 1♀, July 2, 1914 [CU]; 1♀, June 26, 1915 [CU]; 1♂, June 15, 1919 [CU]; 1♂, June 16, 1919 [CU]; 1♀, June 21, 1919 [CU]; 2♀, June 21, 1922 [CU]; 1♂, June 29, 1922 [CU]; 2♀, June 30, 1922 [CU]; 1♂, 1♀, July 2, 1922 [CU]; 1♀, July 4, 1944 [CU]; 1♂, July 7, 1922 [CU]; 1♂, July 2, 1925 [CU]; 1♂, July 2, 1925 [CU]; 1♀, July 9, 1925 [CU]; 1♀, July 25, 1926 (Bolton K. Smith) [CU]; 1♀, July 5, 1928 [AMNH]; 1♂, 1♀, June 16, 1929 [CU]; 1♂, 1♀, July 15 [CU]; 2♀, June 16, 1939 [CU]; Six Mile Creek, Ithaca, 1♂, June 14, 1940 (J. G. Franclemont) [CU]; 1♂, June 4, 1957; 1♂, 1♀, June 14, 1957; 1♀, July 6, 1957; McLean Bogs Res., 1♂, July 4, 1924 [CU]; 2♀, July 22, 1924; 1♀, July 28, 1924; 1♂, July 6, 1946 (J. G. Franclemont) [CU]; 1♀, June 30, 1954 (J. G. Franclemont) [JGF]; 1♀, July 27, 1954; 1♂, July 28, 1954; Varna, 1♂, May 6, 1946 [CNC]; 1♂, June 17, 1946 [CNC]; 1♂, June 22, 1946 (E. G. Munroe) [CNC]; 1♂, June 25, 1949 (Travassos and Rabella) [CNC]; West Chester Co., Katonah, 1♂, July [ANS].

North Carolina: Polk Co., Tryon, 1♂, no date (Fiske) [USNM]; Robeson Co., Maxton, 1♂, May 23, 1944 (A. B. Klots) [AMNH]; Transylvania Co., Brevard, 1♀, June 13, 1942 (W. J. Westfall, Jr.) [CU]; 2♀, July 19, 1942; 2♂, July 23, 1942; 1♀, July 31, 1942.

Ohio: Athens Co., Athens, 1♀, June 27, 1931 (W. C. Stehr) [UM]; Hamilton Co., Cincinnati, 1♂, July 5, 1904 (Annette F. Braun) [ANS].

Pennsylvania: Adams Co., Arendtsville, 1♂, 1♀, July 9, 1921 (S. W. Frost) [CU]; Allegheny Co., 2♀, July 1900 [CM]; 1♂, July 26 [CM]; Oak Station, 1♀, Aug. 2, 1908 (Fred Marloff) [CNHM]; 1♂, June 23, 1909; 1♂, June 4, 1911 (Fred Marloff) [UK]; 1♂, June 14, 1911 (Fred Marloff) [CNHM]; 1♂, June 15, 1911 (Fred Marloff) [UK]; 1♀, June 24, 1911 (Fred Marloff) [CNHM]; Pittsburgh, 2♂, June 13, 1905 (Henry Engel) [CM]; 1♀, June 19, 1905 (Henry Engel) [CM]; 1♂, June 23, 1905 (Henry Engel) [USNM]; 1♀, July 9, 1905; 1♀, July 9, 1905 (Henry Engel) [CM]; 1♂, June 4, 1906 (Henry Engel) [CM]; 1♀, June 17, 1906; 1♂, 1♀, June 18, 1906; 1♂, June 20, 1906; 1♀, June 26, 1906; 1♀, June 27, 1906; 1♂, June 29, 1906; 1♂, July 1, 1906; 1♂, July 6, 1906; 1♀, July 8, 1906 (Henry Engel) [USNM]; 1♂, July 10, 1906; 1♀ [CM]; 2♂, July 15, 1906 (Henry Engel) [CM]; 1♀, Aug. 3, 1906; 2♀, July 15, 1907 (Hugo Kahl) [CM]; 1♂, July 16, 1907; 1♂, July 19, 1907; 1♂, June 23, 1908 (Henry Engel) [CM]; 1♀, June 24, 1908 (F. W. Friday) [LACM]; 1♂, 1♀, June 27, 1909; 1♀, July 15, 1909 (Hugo Kahl) [CM]; 2♂, 1♀, July 8, 1910 (Henry Engel) [CM]; 1♂, June 13, 1911 (Hugo Kahl) [CM]; 1♀, June 15, 1911; 2♂, June 17, 1911; 1♀, Aug. 7, 1911; 1♂, July 12, 1912; 2♂, July 2, 1914 [CM]; 1♂, July 22, 1914 [CM]; 1♂, July 24, 1916 (Henry Engel) [CM]; 1♂, July 28, 1917 [CM]; 1♂, July 31, 1917 [CM]; 1♀, Aug. 17, 1917 [CM]; 1♂, June 6, (Henry Engel) [CM]; 1♂, June 17; 1♂, June 30; 1♂, July 3; 3♀, July 11; 1♀, July 12; 1♂, 1♀, July 14; 1♀, July 15; 1♂, July 20; 1♂, July 24; 1♂, 1♀, July 25; 1♀, August 2; 1♂, Au-

gust 3; Sharpsburg, 3 ♂, June 15–21 (Sweadner) [CM]; 2 ♂, June 22–30; 1 ♀, July 8–14; 6 ♂, 1 ♀, July 15–21; 1 ♂, August 15–21; Beaver Co., New Brighton, 1 ♀, July 2, 1902 (H. D. Merrick) [USNM]; 1 ♂, May 31, 1903; 1 ♂, July 11, 1904; 1 ♀, June 26, 1905 (H. D. Merrick) [UK]; 1 ♀, July 20, 1905 (H. D. Merrick) [USNM]; 1 ♂, June 13, 1906 (H. D. Merrick) [UK]; 1 ♂, July13, 1906 (H. D. Merrick) [USNM]; Berks Co., Sinking Spring, 1 ♀, June 29, 1952 (H. C. Moyer) [CNC]; Blair Co., Tyrone, 1 ♀, July 25, 1917 (J. G. Sanders) [BPI]; Bucks Co., Langhorne, 1 ♀, June 21, 1924 (F. Haimbach) [ANS], Butler Co., Butler, 5 ♂, June 15, 1945 (Preston) [CM]; 4 ♂, June 17, 1945; 1 ♂, June 20, 1945; 2 ♂, June 22, 1945; 1 ♂, June 29, 1945; 7 ♂, 1 ♀, June 1945; 1 ♂, July 8, 1945; 1 ♂, 1 ♀, July 15, 1945; 1 ♂, July 16, 1945; 2 ♂, July 17, 1945; 4 ♂, July 25, 1945; 5 ♂, 4 ♀, July 1945; 1 ♂, Aug. 7, 1945; 1 ♀, Aug. 17, 1945; 2 ♂, 1 ♀, August 1945; 1 ♂, 2 ♀, July 1–7 (Sweadner) [CM]; Cumberland Co., Carlisle, 1 ♂, June 25, 1931 (C. C. Hill) [USNM]; Dauphin Co., Rockville, 2 ♀, July 22, 1917 [BPI]; 1 ♂, June 28, 1918 [BPI]; Fayette Co., Ohiopyle, 1 ♂, Aug. 10, 1905 [CM]; Forest Co., Kelletville, 1 ♂, July [CM]; Lycoming Co., Barbours, 1 ♂, July 8, 1921 (J. C. Bradley) [CU]; Monroe Co., Delaware Water Gap, 1 ♂, no date [AMNH]; Montgomery Co., Homebrook, Lower Merion Tp., 2 ♀, June 23, 1916 [ANS]; 2 ♀, July 11, 1916 [ANS, CNC]; 1 ♀, July 18, 1916 [ANS]; 1 ♀, July 19, 1916 [ANS]; 3 ♀, July 22, 1916 [ANS, CNC]; 2 ♀, July 23, 1916 [ANS]; 1 ♂, Aug. 2, 1916 [ANS]; 1 ♀, Aug. 3, 1916 [ANS]; 1 ♀, Aug. 7, 1916 [ANS]; 1 ♀, July 4, 1917 [ANS]; 1 ♀, July 8, 1917 [ANS]; 1 ♀, July 23, 1917 [ANS]; 1 ♀, Aug. 9, 1917 [ANS]; 1 ♀, June 10, 1920 [ANS]; 1 ♀, June 28, 1921 [ANS]; 1 ♂, 1 ♀, July 7, 1921 [ANS]; Spring Mount, 1 ♂, June 15 (H. A. Wenzel) [ANS]; Philadelphia Co., Philadelphia, 1 ♂, June 16, 1909 (F. Weigand) [CNC]; 1 ♀, June 23 (F. Haimbach) [ANS]; Roxborough, 1 ♂, June 22, 1913 [CNC]; 1 ♂, June 24, 1913 [CNC]; 1 ♂, May 26, 1916 (F. Haimbach) [ANS]; Tioga Co., Blackwell, 1 ♂, July 1, 1921 (J. C. Bradley) [CU]; Washington Co., Finleyville, 2 ♂, June 8–14 [CM]; 1 ♀, June 24, [CM]; 1 ♂, August 15–21 [CM]; 1 ♂, Sept. 22–30, [CM]; Westmoreland Co., Jeannette, 1 ♂, June 15 (H. G. Klages) [CM]; 1 ♂, June 19; 1 ♂, June; 1 ♂, 3 ♀, July 8; 2 ♀, July 19; 1 ♂, 1 ♀, July 25; 1 ♀, July 29; 1 ♀, July 30; 5 ♀, Aug. 6, 1904; 1 ♂, Sept. 19.

South Carolina: Anderson Co., Anderson, 2♂, June 5, 1917 [CU].

South Dakota: Davison Co., Mitchell, 1 ♂, Sept. 14, 1945 (E. C. Johnston) [CNC]; Union Co., Elk Point, 1 ♀, no date (C. N. Ainslie) [USNM]; county unknown, Cedar Pass, Bad Lands, 1 ♂, Aug. 13, 1940 (C. E. Mickel) [UM].

Tennessee: Davidson Co., Nashville, 1 ♂ "6/3" (Ainslie) [USNM]; Grundy Co., Monteagle, 1 ♀, June 30, 1930 (Richards) [CU]; Knox Co., Knoxville, 1 ♀, June 28, 1916 (G. G. Ainslie) [USNM]; Morgan Co., Burrville, 1 ♂, June 27, 1955 (A. K. Wyatt) [CNHM].

Texas: Culberson Co., Guadalupe Mts., 2 mi. north Pine Springs (5700 ft.), 1 ♀, July 19, 1963 (Harry Clench) [CM].

Utah: Tooele Co., Loop Camps, 13 mi. southwest Grantsville (7400 ft.), 1 ♂, July 19, 1958 (F., P., B., and J. Rindge) [AMNH]; 1 ♂, July 6, 1960.

Vermont: Rutland Co., Brandon, 1 ♀, July 15, 1962 (J. C. Shaffer) [JCS].

Virginia: Giles Co., Mountain Lake, 1 ♂, July 8, 1938 (L. J. and M. J. Milne) [CNC].

West Virginia: Greenbrier Co., White Sulphur Springs, 2 ♂, July 21, 1930 (J. G. Needham) [CU].

Wyoming: Carbon Co., Bottle Creek Camp. 7 mi. southwest Encampment (8800 ft.), 1 ♂, Aug. 8, 1959 (F., P., and B. Rindge) [AMNH]; 1 ♂, Aug. 9, 1959; 2 ♂, Aug. 11, 1959; Crook Co., 5 mi. west Alva, 3♂, July 8, 1949 [AMNH; Reuter Canyon Camp, 5 mi. north Sundance (6100 ft.), 2 ♂, July 12, 1959

(F., P., and B. Rindge) [AMNH]; 1 ♂, July 13, 1959; 1 ♂, July 14, 1959; (5900 ft.), 1 ♂, July 11, 1962; Park Co., Cody, 5 ♂, no date [CM]; Lake Creek Camp, 13 mi. southwest Cooke City, Mont. (6900 ft.), 1 ♂, July 25, 1959 (F., P., and B. Rindge) [AMNH].

CANADA: Alberta: Calgary, 1 ♂, July 24, 1905 (F. H. Woolley-Dod) [CNC]; Horseshoe Canyon, Drumheller (2750 ft.), 1 ♂, July 17, 1960 (D. F. Hardwick) [CNC]; Lethbridge, 1 ♂, July 30, 1921 (H. L. Seamans) [CNC]; 1 ♂, June 27, 1956 (E. E. Sterns) [CNC]; 1 ♂, July 7, 1956; Dominion Range Sta. Manyberries, 1 ♂, July 23, 1951 (D. F. Hardwick) [CNC]; 1 ♂, Aug. 2, 1951; 2 ♂, Aug. 3, 1951; 1 ♂, Aug. 4, 1941.

Manitoba: Aweme, 1 ♂, June 23, 1904 (Criddle) [USNM]; 1 ♂, July 1, 1905; 3 ♂, July 2, 1921 (N. Criddle) [CNC]; 1 ♂, July 6, 1921; 1 ♂, 1922; 1 ♂, July 15, 1923; Brandon, 2 ♂, 1 ♀, July 20, 1958 (R. B. Madge) [CNC]; 1 ♂, July 31, 1958 (R. L. Hurley) [CNC]; Cartwright, 1 ♂, July 4, 1904 (E. F. Heath) [USNM]; 1 ♂, July 26, 1905; 2 ♂, July 29, 1905; 1 ♂, no date; Red Rock Lake, Whiteshell For. R., 1 ♀, July 10, 1954 (C. D. Bird) [AMNH]; locality unknown, 1 ♂, July 15 [USNM].

Nova Scotia: Annapolis, 1 ♂, June 20, 1946 (McDunnough and D. Ferguson) [CNC]; 1 ♂, July 5, 1946; 1 ♂, Aug. 1, 1946; 1 ♂, Aug. 13, 1946; Petite Riviere, 2♂, July 21, 1935 (J. McDunnough) [CNC]; Truro, 1♀, July 9, 1913 (R. Matheson) [CU]; 1 ♂, Jul0y 1, 1913; 1 ♀, Aug. 3, 1913.

Ontario: Blackburn, 1♂, June 18, 1941 (J. McDunnough) [CNC]; Black Sturgeon Lake, 1♂, July 23, 1963, [CNC]; Chatham, 1♀, June 27, 1931 (D. A. Arnott) [CNC]; 1♂, July 11, 1931 [CNC]; Constance Bay, 2♂, July 9, 1934 (W. J. B.) [CNC]; Grand Bend, 1♂, July 17, 1939 (T. N. Freeman) [CNC]; Marmore, 1♂, June 13, 1952 (J. R. Vockeroth) [CNC]; 1♂, June 14, 1952; 3♂, 2♀, June 15, 1952; 1♂, June 17, 1952; 1♂, June 19, 1952; 2♂, 3♀, June 20, 1952; 8♂, 1♀, June 21, 1952; 1♂, June 22, 1952; 1♂, 2♀, July 3, 1952; 1♂, July 4,1952; 1♂, July 21, 1952; Mer Bleue, 1♂, June 12, 1937 (G. A. Hobbs) [CNC]; Mer Bleue, Hawthorne, 1♂, June 15, 1937 (E. G. Lester) [CNC]; Normandale, 1♂, July 7, 1956 (Freeman and Lewis) [CNC]; Ottawa, 1♂, June 30, 1907 (C. H. Young) [CNC]; Ottawa, Hunt Club, 2♂, July 8, 1937 (G. S. Walley) [CNC]; Palmer Rapids, 1♀, July 25, 1935 (F. A. Urquhart) [CNC]; Port Colborne, 1♀, June 17, 1934 (J. J. de Gryse) [CNC]; 1♂, June 20, 1934; Sault Ste. Marie, 1♂, July 17, 1957 [CNC]; Simcoe, 2♂, June 9, 1939 (T. N. Freeman) [CNC, LACM]; 1♂, 1♀, June 19, 1939; 1♂, June 20, 1939 (T. N. Freeman) [CNC]; 1♂, July 27, 1939; 1♂, June 5, 1949; 1♀, July 5, 1949; 4♂, July 8, 1949; Strathroy, 2♂, 1♀, July 5, 1926 (H. F. Hudson) [CNC, LACM]; 1♂, July 11, 1929 (H. F. Hudson) [CNC]; Teeswater, 1♂, July 18, 1949 (D. F. Hardwick) [CNC]; 1♂, 1♀, July 20, 1949; 1♂, July 29, 1949; 2♂, Aug. 6, 1949; 1♀, Aug. 9, 1949; Toronto, 1♂, June 1930 (H. S. Parish) [CU]; 1♂, July 1930; Trenton, 2♂, June 18, 1901 (Evans) [CNC]; 1♂, June 16, 1904; 1♀, June 23, 1907; 1♂, June 22, 1908; 1♂, June 14, 1911; 1♂, July 16, 1911; 1♂, June 27, 1912; 1♀, July 6, 1912; 1♂, July 12, 1912; Wanbamie, Parry Sound, 1♂, July 12, 1915 (H. S. Parish) [CU]; Wiarton 3♀, July 26, 1949 (D. F. Hardwick) [CNC].

Quebec: Alcove, 1♀, July 4, 1935 (T. N. Freeman) [CNC]; Duchesnay, 1♀, July 27, 1943 (R. Lambert) [CNC]; 1♂, July 14, 1947; Granby, 1♂, June 22, 1938 (P. E. Mercier) [CNC]; Harrington Lake, Gatineau Park, 1♂, June 11, 1954 (J. E. H. Martin) [CNC]; 1♂, June 13, 1954 (H. J. Huckel) [CNC]; 1♂, June 15, 1954 (Martin) [CNC]; 2♀, June 16, 1954 (Huckel) [CNC]; 2♂, June 18, 1954 (Martin) [CNC]; 2♂, 2♀, June 20, 1954; 3♂, 1♀, June 21, 1954; 4♂, 2♀, June 24, 1954; 1♂, June 25, 1954; Knowlton, 1♂, July 7, 1929 (L. J. Milne) [CNC]; 1♀, July 11, 1929; Lac Mondor, Ste. Flore, 1♂, July 13, 1951 (E. G. Munroe)

[CNC]; L. a la Torrue, 1 ♀, July 16, 1947 [CNC]; 1 ♂, 2 ♀, July 17, 1947 (E. G. Monroe) [CNC]; Meach Lake, 1 ♂, June 23, 1941 (G. A. Hobbs) [CNC]; 1 ♂, June 25, 1941 (G. A. Hobbs) [CNC]; Norway Bay, 1 ♀, July 9, 1937 (E. G. Lester) [CNC]; 1 ♀, July 15, 1937 (F. A. Urquhart) [CNC]; Ste. Anne de Bellevue, 1 ♂, June 29, 1947 (E. G. Monroe) [CNC]; 1 ♂, July 3, 1947; 1 ♂, 2 ♀, July 8, 1947; St. Annes, 2 ♂, 3 ♀, July 5, 1947 (E. G. Munroe) [CNC]; 1 ♂, 9 ♀, July 6, 1947; 7 ♀, July 8, 1947; 3 ♀, Aug. 2, 1947.

Saskatchewan: Christopher Lake, 1 ♂, July 3, 1939 (A. R. Brooks) [CNC]; 1 ♂, July 5, 1939; Indian Head, 1 ♂, July 2, 1924 (J. J. deGryse) [CNC]; 1 ♂, July 29, 1924; Saskatoon, 1 ♂, June 30, 1923 (Kenneth M. King) [CNC]; 1 ♂, July 7, 1923; 1 ♂, July 17, 1923; 1 ♂, July 19, 1923; Willow Bunch. 1 ♂, July 27, 1955 (C. D. Miller) [CNC].

Discussion.—This is the most common and widely distributed member of the subfamily, the species being common from mid-June to early August throughout the northeastern United States. Western specimens tend to be larger and more uniform in maculation than those from the eastern and central states.

Peoria luteicostella (Ragonot), new combination

Figures 12, 82, 117, 155

Hypsotropa luteicostella Ragonot, 1887, p. 19; 1889, p. 117. — Hulst, 1890, p. 212, — Smith, 1891, p. 85. — Ragonot, 1901, p. 376. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — Grossbeck, 1917, p. 134. — Hampson, 1918, p. 70. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

Wekiva nodosella Hulst, 1890, p. 215. — Smith, 1891, p. 85. — Hulst, 1902, p. 440. — Grossbeck, 1917, p. 134. — Rindge, 1955, p. 167.

Osceola perlepidellus Smith, 1891, p. 85. [Nomen nudum. New synonymy.]

Chipeta perlepidella Hulst, 1892, p. 62. — Barnes and McDunnough, 1917, p. 150. — McDunnough, 1939, p. 36. — Rindge, 1955, p. 169. — Kimball, 1965, p. 251. [New synonymy.]

Chipota [sic.] *perlepidella* Hulst, 1902, p. 441.

Bandera perlepidella (Hulst). — Hampson, 1918, p. 90.

Diagnosis.—This species resembles *approximella* in venation and maculation, but lacks the brownish white area posterior to the anal vein. The obliquely ascending palpi of both sexes and the posterolateral gnathos hooks of the male are unique to this species.

Description.—Frons wine red; labial palpi obliquely ascending, wine red on outer sides, light pink on inner sides, third segment and dorsal half of second segment sometimes black on outer sides; maxillary palpi small, wine red; antennae with base wine red anteriorly, white posteriorly, shaft brown, wine red toward base, male laminate; outer sides of occiput, patagia, and tegulae wine red, vertex behind antennae and dorsal area of occiput white; legs white on outer sides, wine red on inner sides, tarsi black on inner sides.

Forewings with broad white band anterior to cell, narrowing to point at apex, bordered anteriorly near base with wine red to black, entire band sprinkled with wine red scales; white band bordered

abruptly behind with black, black blending into posterior wine red area; outer fringe wine red to black. Hindwing light brown, darker in apical area. Venation as in *P. bipartitella.*

Male genitalia with medial process of uncus bearing minute central tooth, rarely several. Gnathos broadening posteriorly into a pair of large flat anteriorly directed hooks. Juxta V-shaped. Vinculum with dorsal margin flanged at apex. Valvae with costa terminating in strong slender spine reaching or surpassing the blunt membranous tip of cucculus; sacculus with numerous fine rather long hairs. Aedeagus with vesica bearing small subserrate cornutus.

Female genitalia with ovipositor moderately setose laterally, numerous fine setae on caudal margin. Posterior apophyses tapering to point at base, not flattened, posterior half strongly curved; anterior with base slightly thickened. Eighth abdominal segment unusually large.

Types.—*H. luteicostella,* in the Muséum National d'Histoire Naturelle; *W. nodosella,* in the U.S. National Museum (lectotype), in the American Museum of Natural History (lectoparatype); *C. perlepidella,* in the American Museum of Natural History.

Type data.—*H. luteicostella,* lectotype male, hereby designated, Florida; genitalia slide No. 535, J. Shaffer, June 20, 1965,

W. nodosella, lectotype male, hereby designated, Florida, Fernald collection; USNM 40081; genitalia slide No. 570, J. C. S., Nov. 23, 1965.

Lectoparatype: Florida; abdomen, antennae, and labial palpi lost.

In the original description of the species Hulst gives April as the date of capture.

C. perlepidella, lectotype female, hereby designated, Florida, collection G. D. Hulst; genitalia slide No. 3228, Carl Heinrich, June 14, 1946.

Specimens examined.—28 ♂, 2 ♀.

Distribution (Map 10).—Southern Georgia and Florida.

UNITED STATES: Florida; Alachua Co., Gainesville, 3 ♂, 1 ♀, July 8, 1927 (J. Speed Rogers) [CU]; 1 ♂, July 1927 (J. Speed Rogers) [CU]; Highlands Co., Archbold Biol. Sta., 1 ♂, June 17, 1964 (Jay C. Shaffer) [JCS]; 2 ♂, June 29, 1964; 3 ♂, July 5, 1964; 1 ♂, July 12, 1964; Hillsborough Co., Stemper, 1 ♂, Aug. 13, 1912 (G. Krautworm) [CM]; Volusia Co., Cassadaga, 1 ♂, Oct. 12, 1962 (S. V. Fuller) [CPK]; Wakulla Co., Panacea, 13 ♂, 1 ♀, Aug. 11, 1926 (C. O. Handley) [USNM].

Georgia: County unknown, Billy's Island, Okefenoke Swamp, 2 ♂, June 1912 [CU].

Anacostia, new genus

Type.—*Anacostia tribulella,* new species.

Diagnosis.—The male genitalia are similar to those of *Peoria,* but differ mainly in the following ways: In *Anacostia* the spicate processes

are three-branched rather than two-branched, the medial band of the uncus has a central pentagonal process, and the juxta bears a pair of lateral knobs, each with a small cluster of setae.

DESCRIPTION.—Labial palpi porrect, about 3½ times as long as eye diameter; maxillary palpi moderate, not reaching frons; male antennae with basal segments of shaft fused, shaft serrate and fasciculate, female unknown; ocelli well developed.

Forewing with 11 veins; R_1 from cell relatively near to R_{2+4}; R_2 relatively long stalked with R_{3+4}; M_{2+3} stalked for about one-half their length or less; Cu_1 from near M_{2+3}. Hindwing with 7 veins; Sc and Rs stalked for about one-half their length; M_3 and Cu_1 stalked for about one-third their length.

Male genitalia with medial band of uncus very broadly rounded, bearing a well-developed, ventrally directed, apical, pentagonal process; spicate processes three-branched. Gnathos broad, flat, thin, broadened at base; sharp pointed apically, but without special process. Juxta V-shaped, bearing pair of setose knobs. Vinculum subquadrate, anterior corners well rounded. Valvae relatively slender; costa sparsely setose, with small apical tooth at tip of valve; sacculus densely pubescent. Aedeagus with vesica unarmed.

Female unknown.

DISCUSSION.—The genus is apparently closely related to *Peoria*, but differences in the male genitalia are too great to allow inclusion of the one species in that genus.

Anacostia tribulella, new species

FIGURES 25, 83, 118

DIAGNOSIS.—This is the only known species in the genus.

DESCRIPTION.—Labial palpi with all segments dark brown to black; antennae brown, shaft with tuft of black scales on basal segments; head and thorax black; legs black on outer sides, brown on inner sides; abdomen dorsally brown, becoming golden brown anteriorly, ventrally black.

Forewing ground dark brown to black; area anterior to cell white sprinkled with black scales; discal spot, transverse anterior, transverse posterior, and subterminal lines black, not conspicuous against ground. Hindwing brown, darker toward apex; terminal line white, brown bordered on both sides.

Genitalia as described for the genus.

TYPES.—In the Academy of Natural Sciences (holotype); in the Cornell University collection (two paratypes).

TYPE DATA.—Holotype, male, Holland Va. (Nansemond Co.), Aug. 1, 1945, O. Buchholz; A.N.S. Type No. 7817; genitalia slide No. 595, J. Shaffer, Apr. 24, 1966.

Paratypes: Two males, both Clyde (Bryan Co.), Georgia, Sept. 11–12, 1931, Bradley and Knorr; C.U. Type No. 4404; one male genitalia slide No. 439, J. Shaffer, Mar. 25, 1965.

Other specimens examined.—None.

Distribution (Map 4).—Probably the Atlantic Coastal Plain; known only from Georgia and Virginia.

Arivaca, new genus

Type.—*Poujadia pimella* Dyar, 1906.

Diagnosis.—Males of this genus may be recognized by the combination of (a) the gnathos bearing a bulbous or padlike medial process, and (b) each spicate process of the uncus having a short posterior and a much longer anterior sharp-pointed spine (figs. 119–125).

Description.—Frons conical, one-half to three-quarter times as long as eye diameter; labial palpi porrect; maxillary palpi very small; tongue poorly developed; antennae with scape compressed, male shaft with basal segments fused, female shaft filiform, scaled dorsally and laterally, finely ciliate ventrally, somewhat compressed; eye diameter about 0.2 mm greater in male than in female; ocelli normal.

Forewings with 10 or 11 veins; R_1 from well before upper outer angle of cell; R_{3+4} stalked; M_1 from the angle; M_{2+3} stalked or fused, from lower outer angle; Cu_1 from just before the angle; Cu_2 from well before the angle. Hindwings with 6 or 7 veins; Sc and Rs approximate or connate on basal half; M_1 from upper outer angle of cell; M_2 absent; $M_{3+}Cu_1$ free, stalked, or fused, from lower outer angle; Cu_2 from before the angle.

Male genitalia with spicate processes of uncus flat, each bearing short sharp posterior and long tapering anterior thorns. Gnathos arms straplike, bearing anteromedial projection; medial process bulbous or padlike. Vinculum broadly rounded. Aedeagus flattened, vesica bearing pair of cornuti.

Female genitalia with ductus bursae flattened, rather long, well sclerotized. Bursa small, lightly sclerotized. Ductus seminalis from posterior half of ductus bursae.

Discussion.—The seven species of *Arivaca* fall into four rather distinct subunits herein distinguished as species groups rather than as genera or subgenera. Because the genus is apparently best developed in the unstudied region south of the United States, it is possible that intermediate forms exist between the species groups, and it is felt best not to give the groups nomenclatural status.

Key to the Species Groups of Arivaca Based Upon the Maculation

1. Cubitus with prominent white streak; white band anterior to cell (figs. 19, 20) . . . . . ***ostreella* group**
   White trace of cubitus not prominent, absent if white band present anterior to cell 2
2. M_{2+3} stalked; forewing not appearing lighter anterior to cell (figs. 15, 16). ***pimella* group**
   M_{2+3} fused; forewing somewhat lighter anterior to cell 3
3. Forewing ground uniform reddish brown, prominent white band anterior to cell (Florida) . . . . . ***albicostella* group**
   Forewing gray, mixture of black and white scales, radius and subcosta white traced (west of Mississippi River) . . . . . ***albidella* group**

The Pimella Group

Diagnosis.—This group may be distinguished by the male valvae, in which the costa ends in a short triangular tooth well before the rounded tip of the cucullus. A similar projecting membranous cucullus exists in *albicostella*, but the costa terminates in a stout spine in that species.

Description.—Frons light brown to brown; labial palpi with basal segment white, second and third segments clothed with white-tipped brown scales dorsally and on outer sides, white ventrally and on inner sides; vertex light brown anteriorly, white posterior to antennae, occiput, patagia, and tegulae brown laterally, lighter dorsally; legs clothed with white-tipped brown scales on outer sides, white on inner sides.

Forewing ground light orange brown, veins white traced and bordered with brown, A_1 and A_2 traced for most of their length, A_3 traced at base; 11 veins; M_{2+3} stalked. Hindwing light brown, fringe white; 7 veins; M_3 usually free from lower outer angle of cell.

Male genitalia with uncus moderately well sclerotized between spicate processes. Juxta rounded, with caudal V-shaped notch. Valvae with costa sparsely setose, apically bearing short triangular tooth; cucullus with rounded membranous tip projecting well beyond costa; sacculus with patch of stiff setae. Aedeagus with cornuti serrate, small, subequal.

Female genitalia with base of posterior apophyses flat, shaped like parallelogram. Bursa unarmed.

Discussion.—The two included species may be separated by the condition of vein R_2, which is stalked with R_{3+4} in *linella* but free in *pimella*, but this character is usually variable elsewhere in the subfamily so that positive identification should rest with examination of the male genitalia.

Key to Species of the Pimella Group Based Upon the Male Genitalia

Posterior margin of medial process of uncus flat, usually bearing pair of short, sharp lateral teeth; apical process of gnathos padlike, not strongly projecting (fig. 120) . . . . . **linella**

Posterior margin of medial process of uncus rounded, unarmed; apical process of gnathos bulbous, strongly projecting dorsally (fig. 119) . . . . . **pimella**

Arivaca pimella (Dyar), new combination

FIGURES 15, 50, 52, 84, 119, 156

Poujadia pimella Dyar, 1906, p. 31. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36.

DIAGNOSIS.—The broadly rounded unarmed medial process of the uncus and the strongly projected medial process of the gnathos each separate this species from *linella*.

DESCRIPTION.—Antennae white, male shaft laminate, cilia about one-fifth as long as segment width.

Forewing sprinkled with brown and white anterior to cell; cell brownish white; R_2 free from cell. Hindwing light brown in female, somewhat darker in male.

Male genitalia with medial process of uncus rounded, unarmed. Gnathos with apical process strongly projected dorsally.

TYPE.—In the U.S. National Museum.

TYPE DATA.—Lectotype male, hereby designated, Babaquivera Mts., Pima County, Ariz.; USNM 9012; genitalia slide No. 567, J. Shaffer, Nov. 23, 1965.

SPECIMENS EXAMINED.—45 ♂, 36 ♀.

DISTRIBUTION (Map 9).—Southern Arizona.

UNITED STATES: ARIZONA: Cochise Co., Cochise Stronghold, 1 ♀, Aug. 30, 1958 (P. Opler) [UCB]; Paradise, 1 ♂, 1 ♀, September (Poling) [CM]; Chiricahua, 1 mi. west portal, 1 ♂, 1 ♀, Sept. 10, 1950 (Cohn, Boone, Cazier) [AMNH]; Ramsay Canyon, Huachuca Mts., 1 ♂, 1 ♀, July 10–15, 1941 (A. B. Klots) [AMNH]; San Bernardino Ranch (3750 ft.), 1 ♀, August (F. Snow) [UK]; Southwestern Res. Sta., 5 mi. west Portal, 1 ♂, Sept. 6, 1959 (J. R. Bowers) [UCB]; 1 ♂, Aug. 25, 1962 (M. Statham) [AMNH]; 1 ♀, Sept. 2, 1959 (Carl W. Kirkwood) [CPK]; 1 ♀, Sept. 17, 1959; 1 ♀, Sept. 20, 1959; Gila Co., vicinity Globe, 1 ♂, Aug. 4–5, 1937 (A. B. Klots) [AMNH]; Pima Co., "Baboquavaria Mts.," 4 ♂, July 15–30, 1903 (O. C. Poling) [USNM]; 2 ♀, July 1–15, 1923; 2 ♂, July 15–30, 1923; 1 ♂, 2 ♀, Aug. 1–4, 1923; 1 ♀, Aug. 15–30, 1923; 1 ♂, 1 ♀, Aug. 24–31, 1923; 4 ♂, 4 ♀, Sept. 1–15, 1923; 1 ♂, Oct. 1–15, 1923; 1 ♂, July 15–30, 1924; 7 ♂, 1 ♀, Sept. 1–15, 1924; 1 ♂, Oct. 1–15, 1924; Brown Canyon, Baboquivari Mts., 1 ♂, Sept. 5, 1953 (Lloyd M. Martin) [LACM]; 1 ♂, Sept. 6, 1953; Madera Canyon, Santa Rita Mts., 1 ♀, Aug. 25, 1946 (J. A. Comstock, Lloyd M. Martin) [LACM]; 1 ♂, Aug. 2, 1947; 3 ♀, Sept. 7, 1948 (Lloyd Martin) [LACM]; 1 ♂, Sept. 8, 1948; 1 ♀, Aug. 15, 1949 (C. W. Kirkwood) [LACM]; 1 ♀, Aug. 17, 1949; 1 ♀, Sept. 11, 1950; 1 ♂, 1 ♀, Sept. 13, 1950; 1 ♀, Sept. 15, 1950; 1 ♂, Sept. 5–12, 1951 (William Hammer) [CNC]; 1 ♀, Aug. 8, 1952 (C. W. Kirkwood) [LACM]; 1 ♂, Aug. 14, 1952; 2 ♀, Aug. 30,

1952 (Lloyd Martin) [LACM]; 6 ♂, 1 ♀, Aug. 19, 1953 (Robert J. Ford) [CNC]; 1 ♀, Aug. 16, 1953; 1 ♀, Aug. 18, 1953; 1 ♀, Aug. 21, 1953; 1 ♀, Sept. 2, 1953 (Lloyd Martin) [LACM]; 1 ♂, Sept. 8, 1953; 2 ♀, Aug. 24–Sept. 2, 1957 (W. A. Hammer) [LACM]; locality unknown: "So. Arizona," 3 ♂, 1 ♀, August 1–15 (Poling) [USNM].

Discussion.—In the original description Dyar lists two males, one of these is in the National Museum, the fate of the other is unknown.

Arivaca linella, new species

Figures 16, 56, 85, 120, 157

Diagnosis.—The flat, moderately well sclerotized medial process of the uncus distinguishes this species within the genus. The stalked condition of R_2 separates both sexes from *pimella*.

Description.—Antennae light brown, sublaminate in male, cilia about one-third as long as segment width, female with shaft white.

Forewings brown anterior to cell; R_2 stalked with R_{3+4}.

Male genitalia with mediodistal margin of uncus irregular, usually bearing pair of small sharp teeth laterally. Gnathos with apical process padlike, not strongly projected dorsally.

Types.—In the Canadian National collection.

Type data.—Holotype male, Colfax County, N. Mex., Sangre de Cristo Mts., Cimarron Canyon (7900 ft.), July 13, 1962, E. and I. Munroe; C.N.C. Type No. 9442; genitalia slide No. 274, J. Shaffer, Sept. 15, 1964.

Paratypes: Four males, same data and locality as holotype.

Specimens examined.—18 ♂, 3 ♀.

Distribution (Map 9).

UNITED STATES: Arizona: Apache Co., 3 mi. west Eagar (7100 ft.), Pinon-Juniper life zone, 1 ♂, July 13, 1962 (E. and I. Munroe) [CNC]; Greer, White Mts. (8500 ft.), 1 ♂, Aug. 2, 1962 (E. and I. Munroe) [CNC]; 1 ♀, Aug. 4, 1962; 5 ♂, Aug. 6, 1962; 1 ♀, Aug. 9, 1962; 1 ♂, Aug. 11, 1962.

Colorado: "Rock Creek Canyon," 1 ♂, July 19, 1961 (Margot May) [CPK].

New Mexico: Colfax Co., Cimarron Canyon, Sangre De Cristo Mts. (7900 ft.), 2 ♂, July 14, 1962 (E. and I. Munroe) [CNC]; McKinley Co., McGaffey, Zuni Mts. (7500 ft.), 1 ♂, July 21, 1962 (E. and I. Munroe) [CNC]; 1 ♂, July 25, 1962; Sandoyal Co., Frijoles Canyon, Bandelier Nat. Mon. (6050 ft.), 4 ♂, July 17, 1962 (E. and I. Munroe) [CNC]; 1 ♀, July 18, 1962; Horseshoe Springs Camp, 2 mi. west La Cueva (7900 ft.), 1 ♂, July 29, 1961 (F., P., and J. Rindge) [ABK].

The Ostreella Group

Diagnosis.—The group is easily recognized by the light orange forewings with the costal margin and cubitus both prominently marked with white. The tapering pointed valvae distinguish males of the group.

DESCRIPTION.—Frons about three-fourths as long as diameter of eye, orange laterally, lighter dorsally; labial palpi with basal segment white, second and third segments orange brown on outer sides, white on inner sides; antennae white, finely pubescent, bearing tuft of scales on basal segments of shaft; occiput and vertex white behind antennae, occiput brown laterally, patagia and tegulae light orange.

Forewing with broad white band anterior to cell, costa margined basally with dark brown; white band bordered posteriorly with narrow dark brown band dividing distally to trace R_4 and M_1; prominent white band tracing cubitus and M_2, broadest near lower outer angle of cell; Cu_1 and Cu_2 traced with mixture of brown and white; R_2 from close to R_{3+4}, sometimes short stalked. Hindwing with 7 veins; M_3 and Cu_1 from point or short stalked.

Male genitalia with medial process of uncus well sclerotized, rounded, bearing pair of caudomesally directed spines. Gnathos with medial process strongly projected. Valvae tapering to point.

Female genitalia with eighth abdominal segment heavily sclerotized, tapering posteriorly. Anterior apophyses strongly divergent; posterior parallel, pointed at base.

Key to the Species of the Ostreella Group Based Upon External Characters

M_{2+3} forked; white band extending from cell to costal margin . . . . **ostreella**
M_{2+3} fused; white band extending half way from cell to costal margin, bordered anteriorly with light orange . . . . . **poohella**

Arivaca ostreella (Ragonot), new combination

FIGURES 19, 53, 86, 121, 158

Saluria ostreella Ragonot, 1887, p. 18; 1889, p. 117. — Smith, 1891, p. 85.— Ragonot, 1901, p. 362. — Hulst, 1902, p. 438. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 102. — McDunnough, 1939, p. 36.

Saluria ostrella [sic] Hulst, 1890, p. 211.

Peoria discostrigella Dyar, 1904, p. 115. [New synonymy.]

DIAGNOSIS. — The stalked condition of M_{2+3} distinguishes both sexes from *poohella*. Males are easily recognized by the pectinate antennae.

DESCRIPTION.—Labial palpi about 4½ times as long as diameter of eye; male antennae pectinate.

Forewing with cell brownish orange; A_1 faintly traced on distal third; A_2 and A_3 basally traced with mixture of white and brown, A_2 usually broadly so; ground yellow or light orange posterior to cell; 11 veins; M_{2+3} stalked. Hindwing light brown in both sexes.

Male genitalia with uncus bearing heavy mediodorsal triangular plate, sharp pointed caudally. Juxta round, with deep V-shaped

caudal incision. Valvae tapering to rounded tip; costa with small medial tooth. Aedeagus with vesica bearing one small serrate and one large pectinate cornutus.

Female genitalia with bursa unarmed.

TYPES.—*S. ostreella*, in the British Museum (Natural History); *P. discostrigella*, in the U.S. National Museum.

TYPE DATA.—*S. ostreella*, lectotype female, hereby designated, labeled as follows: "Type; ARIZONA. Morrison.; Paravicine Coll. B.M. 1937–383.; *Anerastia ostreella* Rag. type; *Saluria ostreella* Ragonot; ♀ genitalia slide I–4–1967 J. Shaffer No. 704." *P. discostrigella*, lectotype female, hereby designated, Roswell, New Mexico, August 22, Cockerell; USNM 7933; genitalia slide No. 566, J. C. S., Nov. 23, 1965. In the original description Dyar reports: "Three ♀♀, Roswell, New Mexico, August 22 (T. D. A. Cockerell), Tucson, Arizona, July 21 (E. A. Schwarz)."

SPECIMENS EXAMINED.—6 ♂, 49 ♀.

DISTRIBUTION (Map 9).—Southern Arizona to Brownsville, Tex.

UNITED STATES: ARIZONA: Cochise Co., Southwestern Research Sta., 5 mi. west Portal (5400 ft.), 9 ♀, July 15, 1955 (W. J. Gertsch) [AMNH]; 1 ♀, July 26, 1955; 1 ♂, June 12, 1958; Pima Co., Redington, 3 ♀, no date [USNM]; "Tuson," 1 ♀, "21. 7." (E. A. Schwarz) [USNM].

NEW MEXICO: Chaves Co., Roswell, 1 ♀, August (Cockerell) [USNM]; Eddy Co., White City, 3 ♀, May 14, 1950 (E. C. Johnston) [CNC]; 1 ♀, May 16, 1950; 1 ♂, 2 ♀, July 23, 1959, (A. B. Klots) [ABK]; Hidalgo Co., Lordsburg, 3 ♀, Aug. 4, 1937 [AMNH]; Luna Co., 10 mi. east Deming, 3 ♂, 2 ♀, July 12, 1917 [CU]; 14 ♀, July 8–15 [USNM].

TEXAS: Brewster Co., Alpine, Davis Mts., 1 ♀, Sept. 12, 1958 (R. R. McElvare) [CNHM]; Big Bend, 1 ♂, Apr. 15–30, 1926 (O. C. Poling) [USNM]; 1 ♀, May 1–15, 1926; Cameron Co., San Benito, 2 ♀, July 8–15 [USNM]; ♀, August [USNM]; Reves Co., 35 mi. northwest Pecos, 4 ♀, June 15, 1937 (George Willett) [LACM].

Arivaca poohella, new species

FIGURES 20, 57, 87, 122, 159

DIAGNOSIS.—The fused condition of M_{2+3} distinguishes this species from *ostreella*, as does the light orange trace on the costal margin.

DESCRIPTION.—Labial palpi 3½ to 5½ times as long as eye diameter; antennae sublaminate in male.

Forewing with white costal band extending half way from cell to costa, bordered anteriorly with light orange; cell orange; A_1 sometimes faintly traced near outer margin; A_2 and A_3 near base traced with white and bordered with dark brown; ground lighter orange posterior to A_1 fold; 10 veins; M_{2+3} fused. Hingwing dark brown in male, light brown in female.

Male genitalia with juxta rectangular; distally concave, proximally convex. Valvae tapering to point at apex of costa. Aedeagus with cornuti elliptical, serrate.

Female genitalia with bursa bearing near its base a cluster of about 20 stout, sharp-pointed, inwardly directed spines.

Types.—In the collection of John G. Franclemont, Cornell University.

Type data.—Holotype male, Madera Canyon, 5600 ft., Santa Rita Mts., Santa Cruz County, Ariz., June 24, 1963, J. G. Franclemont; genitalia slide No. 714, J. Shaffer, Jan. 16, 1967.

Paratypes: Three males, two females, same data as holotype except as follows: two males, June 29, 1963, one with genitalia slide No. 715, J. Shaffer, Jan. 16, 1967; one male, June 28, 1963, genitalia slide No. 724, J. Shaffer, Jan. 27, 1967; one female, June 28, 1963, genitalia slide No. 716, J. Shaffer, Jan. 16, 1967.

Other specimens examined.—7 ♂, 15 ♀.

Distribution (Map 9).—Southern Arizona to Brownsville, Tex.

UNITED STATES: Arizona: Cochise Co., Southwestern Res. Sta., 5 mi. west Portal (5400 ft.), 1 ♀, May 15, 1956 (M. Statham) [AMNH]; 1 ♀, June 29, 1956 (Cazier and Ordway) [AMNH]; 1 ♀, July 5, 1956; 1 ♂, July 9, 1956, 1 ♂, 1 ♀, July 11, 1958 (M. A. Cazier) [AMNH]; Pima Co., Baboquivari Mts., 1 ♂, July 1–15, 1923 (O. C. Poling) [USNM]; 1 ♀, July 1–15, 1924; 1 ♀, Aug. 15–30, 1924; Redington, 1 ♀, no date [USNM]; Santa Cruz Co., Madera Canyon, Santa Rita Mts. (5800 ft.), 1 ♂, 1 ♀, June 22, 1960 (David A. Wallesz) [CU]; 2 ♀, June 24, 1960; (4800 ft.) 1 ♀, June 18, 1963 (J. G. Franclemont) [JGF]; 2 ♀, June 29, 1963; 1 ♂, 1 ♀, July 1, 1963.

The Albidella Group

Diagnosis.—Males of the group are delimited by the broadly rounded apex of the valvae, the cucullus not exceeding the costa.

Description.—Frons of white-tipped brown scales; labial palpi about twice length of head, basal segment light brown, of white-tipped brown scales dorsally and on outer sides, white ventrally and on inner sides; antennae light brown, finely ciliate ventrally, tuft of scales on basal segments of shaft.

Forewing uniformly gray, a mixture of dark brown and white scales, Rs white traced; 10 veins; R_2 stalked with R_{3+4}; M_{2+3} fused. Hindwing light brown; 7 veins, but M_3 sometimes completely fused with Cu_1.

Male genitalia with medial part of uncus poorly sclerotized, irregularly rounded. Apical process of gnathos well projected dorsally. Juxta subquadrate, anterior margin rounded, posterior with broad V-shaped notch. Valvae with costa setose, blunt tooth at apex and another just under half distance to base; tip rounded; sacculus finely setose. Aedeagus with cornuti equal or nearly so, serrate.

Female genitalia as in the Pimella Group.

Key to the Species of the Albidella Group

Forewing appearing lighter posterior to A_1 fold; posterior cusp of spicate process a small triangular tooth about one-eighth length of anterior cusp (fig. 123) **albidella**

Forewing not appearing lighter posterior to A_1 fold; posterior cusp of spicate process a sharp thorn about one-fourth length of anterior cusp (fig. 124). **artella**

Arivaca albidella (Hulst), new combination

FIGURES 17, 88, 123, 160

Peoria albidella Hulst, 1900, pp. 175, 439. — Barnes and McDunnough, 1917, p. 149.—McDunnough, 1939, p. 36.

DIAGNOSIS.—Distinguishing features are given in the above key.

DESCRIPTION.—Forewings light tan to grayish brown, appearing lighter posterior to A_1 fold.

Male genitalia with posterior cusp of spicate process poorly developed, usually rounded, sometimes sharp pointed, usually no more than one-tenth length of anterior process.

TYPE.—In the U.S. National Museum.

TYPE DATA.—Lectotype male, hereby designated, Death Valley, "April 91 K."; USNM 4809; genitalia slide No. 571, J. Shaffer, Nov. 23, 1965. In the original description Hulst notes: "Death Valley, Cal.; taken by Mr. Koebele, in April. The type number of the National Museum is 4709."

SPECIMENS EXAMINED.— 7 ♂, 1 ♀.

DISTRIBUTION (Map 9).—Southwestern United States.

UNITED STATES: NEW MEXICO: Dona Ana Co., Mesquite, near Mesilla Park,[2] 2 ♂, July 12, 1917 [CU].

TEXAS: Reeves Co., Pecos, 4 ♂, 1 ♀, May 18, 1950 (E. C. Johnston) [CNC]; 1 ♂, June 2, 1950.

Arivaca artella, new species

FIGURES 18, 89, 124, 161

DIAGNOSIS.—Distinguishing features are given in the above key.

DESCRIPTION.—Male genitalia with posterior cusp of spicate process well developed as a sharp-pointed thorn about one-fourth as long as anterior cusp. Apical process of gnathos strongly projected, somewhat T-shaped in lateral view.

TYPE.—In the Cornell University collection.

TYPE DATA.—Holotype male, Mesquite near Mesilla Park, N. Mex., July 12, 1917; Cornell University lot No. 542, sublot No. 46; lot No. 551, sublot No. 916; CU Type No. 4406; genitalia slide No. 366, J. Shaffer, Feb. 12, 1965.

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[2] Spelled Mesille Park on specimen labels.

Paratypes: Three males, same date and locality as holotype, Cornell University lot No. 542, sublot No. 46.

OTHER SPECIMENS EXAMINED.—14 ♂, 3 ♀.

DISTRIBUTION (Map 9).

UNITED STATES: ARIZONA: Apache Co., St. Johns, 3 ♂, July 26, 1937 (A. B. Klots) [AMNH].

NEW MEXICO: Dona Ana Co., Mesquite near Mesilla Park, 10 ♂, July 12, 1917 (from same lot as type series) [CU]; Hidalgo Co., Cienaga Ranch, near Rodeo, 1 ♀, July 12, 1948 (C. and P. Vaurie) [AMNH]; Sandoval Co., Jemez Springs (6200 ft.), 1 ♀, July 16, 1950 (Cohn, Boone, Cazier) [AMNH]; Sulphur Dam, 5 mi. north Jemez Springs (6300 ft.), 1 ♂, July 17, 1950 (Cohn, Boone, Cazier) [AMNH]; county unknown, 1 ♀, no date [AMNH].

The Albicostella Group

Arivaca albicostella (Grossbeck), new combination

FIGURES 21, 60. 90, 125, 162

Calera (?) *albicostella* Grossbeck, 1917, pp. 134–135. — Klots, 1942, p. 419.
Peoria albicostella (Grossbeck). — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

DIAGNOSIS.—The presence of a white costal band coupled with the absence of white tracing on the cubitus distinguishes this species within the genus. In no other species of *Arivaca* does the male costa terminate in a subapical spine.

DESCRIPTION.—Frons brown; labial palpi about 2½ times as long as eye diameter, basal segments light brown, second and third segments clothed with light brown tipped brown scales on outer sides, light brown on inner sides and ventrally; antennae with scape brown, shaft light brown, laminate, basal segments bearing tuft of scales, cilia slightly less than half as long as segment width; frons and vertex light brown dorsally, vertex brownish white posterior to antennae, occiput brownish white dorsally, brown laterally, patagia and tegulae brown; legs clothed with white tipped brown scales on outer sides, white on inner sides.

Forewing reddish brown, often sprinkled with light brown and dark brown scales; light brown anterior to cell, sometimes sprinkled rather heavily with darker scales. Hindwings light brown. Venation as in the Albidella Group.

Male genitalia with medial part of uncus weakly sclerotized, rounded; spicate process with posterior thorn directed dorsally, then reflexed 90° near base and caudally directed (fig. 125). Juxta rounded, posterior margin concave. Valvae with costa sparsely setose, produced as free spine before rounded membranous apex of cucullus; sacculus finely setose. Aedeagus with cornuti elliptical, serrate.

Female genitalia as in the Pimella Group.

Type.—In the American Museum of Natural History.

Type data.—Lectotype female, designated by Klots (1942), Fort Myers, Fla., Apr. 23, 1912; genitalia slide No. 586, J. Shaffer, Nov. 28, 1965.

Lectoparatype female, Everglades, Fla., Apr. 7, 1912.

Specimens examined.—10 ♂, 3 ♀.

Distribution (Map 10). — Known only from southern Florida.

UNITED STATES: Florida; Broward Co., Ft. Lauderdale, ♀, Mar. 27, 1928 (D. M. Bates) [CPK]; Collier Co., Everglades, 4 ♂, April 1–7 [USNM]; 3 ♂, April 8–15 [USNM]; Dade Co., Paradise Key, Everglades National Park, ♀, Apr. 2, 1952 (G. S. Walley) [CNC]; ♂, Apr. 3, 1952; Sarasota Co., ♀, May 13, 1946 (C. P. Kimball) [CPK]; Siesta Key, ♂, Mar. 31, 1952 (C. P. Kimball) [CPK]; ♂, Mar. 30, 1954 (C. P. Kimball) [CPK].

Atascosa Hulst

Atascosa Hulst, 1890, p. 210. — Smith, 1891, p. 85. — Hulst, 1902, p. 438. [Type: *Atascosa bicolorella* Hulst, 1890. Original designation.]

Diagnosis. — The flat, elbowed, bluntly pointed spicate processes of the uncus (fig. 126) are diagnostic of the genus.

Description. — Frons conical; labial palpi upturned with third segment decumbent in males, porrect in females; maxillary palpi reaching frons, cylindrical tuft of long slender scales, sometimes expanded and fanlike; antennae sublaminate, ciliate in males, filiform, finely ciliate in females; ocelli well developed.

Forewing with 11 veins; R_1 free from cell; R_2 from near to or stalked with R_{3+4}; M_{2+3} stalked for about half its length. Hindwing with 7 veins; Sc and Rs stalked; M_1 from upper outer angle of cell; M_2 absent; M_3 stalked with Cu_1, from lower outer angle; Cu_2 from just before the angle.

Male genitalia with spicate processes in form of a pair of flat lateral arms, ventroposteriorly directed from base, then elbowed and distal half ventrally directed; arms bluntly pointed. Gnathos with apical process a small posteroventrally directed thorn; arms straplike. Juxta subquadrate, shieldlike. Vinculum V-shaped, somewhat flattened anteriorly. Valvae with costa bearing subapical spine; sacculus with numerous stout setae; cucculus rounded, membranous, surpassing costa. Aedeagus flattened, vesica unarmed.

Female genitalia with ovipositor moderately setose, caudal margin finely setose. Apophyses fairly straight, of about equal length; well developed; base of posterior shaped like a parallelogram; anterior curved downward near base. Bursa unarmed. Ductus seminalis from posterior end of bursa.

Atascosa glareosella (Zeller)

FIGURES 26, 54, 91, 126, 163

Anerastia glareosella Zeller, 1872, pp. 553–554.
Saluria glareosella (Zeller). — Ragonot, 1889, p. 117. — Hulst, 1890, pp. 211–212. — Smith, 1891, p. 85. — Hampson, 1918, pp. 95–96.
Atascosa bicolorella Hulst, 1890, pp. 210, 227. — Smith, 1891, p. 85. — Rindge, 1955, p. 158.
Maricopa albocostella Hulst, 1900, p. 176 [described in Phycitinae]; 1902, p. 438. — Rindge, 1955, p. 157. — Heinrich, 1956, p. 316 [transferred to Anerastiinae]. [New synonymy.]
Poujadia glareosella (Zeller). — Ragonot, 1901, pp. 345–346. — Barnes and McDunnough, 1917, p. 149. — Forbes, 1923, p. 638. — McDunnough, 1939, p. 36.
Atascosa glareosella (Zeller). — Hulst, 1902, p. 438.
Valdiva albocostella (Hulst). — Barnes and McDunnough, 1917, p. 148. — McDunnough, 1939, p. 34.

DIAGNOSIS. — This is the only known species in the genus.

DESCRIPTION.—Frons dark brown, with red posterodorsal patch; labial palpi with basal segments white, second and third segments dark brown on outer sides, ventrally white sprinkled with red; antennae with scapes white on outer sides, mixture of red and brown on inner sides, shaft light brown; vertex and occiput brown, lighter dorsally; patagia, tegulae, and dorsum of thorax dark brown, usually sprinkled with red.

Forewing with white costal band extending posterior to middle of cell, narrowing to point at apex, sprinkled with grayish red, grayish-red basal dash; white band bordered posteriorly by dark brown band, mixture of grayish red and dark brown distal to cell; posterior of grayish red and dark brown distal to cell; posterior third of wing grayish red sprinkled with brown; transverse posterior band dark brown; discocellular traced with dark brown, forming discal spot; fringe brown, with three white lines. Hindwing light brown, darker toward apex.

Genitalia as described for the genus.

TYPES.—*A. glareosella*, in the British Museum (Natural History), (from Zeller collection); *A. bicolorella* and *M. albocostella*, in the American Museum of Natural History.

TYPE DATA.—*A. glareosella*, lectotype female, hereby designated, labeled as follows: "Type; 15/8; Bosque Co. Texas; Zell. Coll. 1884.; Anerastia glareosella Z. N.A.I. 553 [green label in Zeller's handwriting]; ♀ genitalia slide I–4–1967 J. Shaffer No. 709."

A. bicolorella, lectotype male, hereby designated, Blanco County, central Texas, August, collection G. D. Hulst; genitalia slide No. 3222, Carl Heinrich, June 14, 1947.

M. albocostella, lectotype male, hereby designated, Anglesea, N.J., August 21?, collection G. D. Hulst, genitalia slide No. 3219, Carl Heinrich, June 14, 1946. Lectoparatype male, Anglesea, N.J., August 21?, collection G. D. Hulst.

Specimens examined.—44 ♂, 18 ♀.

Distribution (Map 12).—Atlantic and Gulf Coastal Plain, Texas to Florida, north to Massachusetts.

UNITED STATES: Colorado: El Paso Co., Colorado Springs, Fountain Valley School, 1 ♂, July 7, 1935 [AMNH] (see discussion section).

Connecticut: New Haven Co., East River, 1 ♂, Aug. 12, 1907 (Charles R. Ely) [USNM]; 1 ♂, Aug. 16, 1907; 2 ♂, July 19, 1908; 2 ♂, July 20, 1908; 1 ♂, July 22, 1908; 1 ♂, July 24, 1908; 2 ♂, 1 ♀, July 27, 1908; 1 ♂, July 28, 1908; 1 ♂, July 30, 1908; 1 ♂, Aug. 1, 1908; 1 ♀, Aug. 2, 1908; 1 ♀, Aug. 7, 1909; 1 ♂, Aug. 10, 1909; 1 ♂, Aug. 12, 1909; 1 ♂, 1 ♀, July 1910; 1 ♀, July 19, 1912; 1 ♂, Aug. 1, 190?.

Florida: Dade Co., Homestead, 1 ♂, Aug. 7, 1963 (D. O. Wolfenbarger) [CPK].

Massachusetts: Barnstable Co., Barnstable, 1 ♂, July 4, 1949 (C. P. Kimball) [CU]; 1 ♂, July 10, 1949 (C. P. Kimball) [CU]; 2 ♂, July 10, 1949 (C. P. Kimball) [CPK]; 1 ♀, July 12, 1949; 1 ♂, Aug. 1, 1952; West Barnstable, 3 ♂, July 15, 1949 (C. P. Kimball) [CPK]; 1 ♂, July 16, 1949 (C. P. Kimball) [CNC]; 2 ♂ 4 ♀, [CU]; 1 ♂, July 17, 1949 (C. P. Kimball) [CU]; 1 ♂, July 18, 1949 (C. P. Kimball) [CPK]; 1 ♀, July 20, 1949; Dukes Co., Martha's Vineyard, 1 ♂, Aug. 11, 1946 (F. M. Jones) [CNC]; 1 ♂, July 18 (F. M. Jones) [CPK].

New Jersey: Bergen Co., Oakland, 1 ♂, July 26, 1947 (C. P. Kimball) [CPK]; 1 ♂, July 27, 1947 (C. P. Kimball) [CU]; 1 ♀, Aug. 4, 1948 (C. P. Kimball) [CPK]; 1 ♂, Aug. 9, 1948 (C. P. Kimball) [CU]; 1 ♂, Aug. 13, 1948; 1 ♂, Aug. 14, 1948; 1 ♂, Aug. 24, 1948; Burlington Co., New Lisbon, 1 ♂, July 31, 1931 (E. P. Darlington) [ANS]; 1 ♀, July 14, 1933; 1 ♂, Aug. 10, 1939; 1 ♀, July 31, 1942; 1 ♂, Aug. 4, 1942; Morris Co., Mendham, 1 ♂, Aug. 3, 1935 (G. H. Tate) [AMNH]; Ocean Co., Lakehurst, Wrangle Brook Road, 1 ♀, Aug. 30, 1956 (J. G. Franclemont) [JGF].

New York: Suffolk Co., Riverhead, 1 ♂, July 1, 1933 (Roy Latham) [CU].

North Carolina: Polk Co., Tryon, 1 ♀, Aug. 11, 1904 (Fiske) [USNM]; 1 ♀, Aug. 14, 1904.

Discussion.—The Colorado specimen has wing venation and male genitalia typical of *glareosella*, but differs in having uniform brownish-orange forewings, unmarked except by a faint discal spot, and in being slightly larger than typical members of the species. The specimen may or may not be *glareosella*.

Homosassa Hulst

Homosassa Hulst, 1890, p. 214. — Smith, 1891, p. 85. — Hulst, 1902, p. 440. [Type: *Ephestia ella* Hulst, 1887. Monobasic.]

Diagnosis.—The long, straight, unbranched ventrolaterally directed spicate processes of the uncus are diagnostic of the genus.

DESCRIPTION.—Labial palpi of males obliquely ascending with third segment somewhat decumbent, two to 2½ times as long as eye diameter, females porrect, three times eye diameter; maxillary palpi small; tongue rudimentary; antennae sublaminate and ciliate in males, filiform and finely ciliate in females; ocelli normally developed.

Forewing with 10 or 11 veins; R_2 free from cell or stalked with R_{3+4}; M_{2+3} stalked or fused, from lower outer angle of cell; Cu_1 from just before the angle. Hindwing with 7 veins; Sc and Rs stalked; M_1 from upper outer angle; M_2 lost; M_3 stalked with Cu_1, from lower outer angle of cell; Cu_2 from just before the angle.

Male genitalia with spicate processes of uncus straight, unbranched, ventrolaterally directed, tapering to broad triangular base.

Juxta shield-shaped. Valvae subrectangular with costa projecting, bluntly rounded and flattened apically; sacculus rather densely setose. Aedeagus with thickened ring on posterior end.

Female genitalia with ovipositor strongly compressed. Apophyses rather straight, about equal in length. Bursa unarmed. Ductus seminalis from posterior end of bursa.

Key to the Species of Homosassa

1. M_{2+3} fused (fig. 58) . . . . . **ella**
   M_{2+3} stalked (fig. 54) 2
2. Male with uncus bearing well sclerotized ring (fig. 129) . . . . . **incudella**
   Male with uncus not bearing sclerotized ring (fig. 128) . . . . . **platella**

Homosassa ella Hulst

FIGURES 27, 58, 92, 127, 164

Ephestia ella Hulst, 1887. — Rindge, 1955, p. 161.

Anerastia ella (Hulst). — Ragonot, 1889, p. 117; 1901, p. 400. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

Homosassa ella Hulst, 1890, pp. 214, 227. — Smith, 1891, p. 85. — Hulst, 1902 p. 440. — Grossbeck, 1917, p. 134.

Rhinaphe ella (Hulst). — Hampson, 1918, p. 86.

DIAGNOSIS.—The loss of vein M_2 distinguishes this species from the other two members of the genus.

DESCRIPTION.—Frons conical, dark brown; labial palpi with basal segments white, second and third segments dark brown dorsally, white ventrally and on inner sides; antennae with scape dark brown anteriorly, white posteriorly, shaft light brown; vertex, occiput, patagia, tegulae, and dorsum of thorax brown to dark brown; legs brown, lighter on inner sides, tarsal scales white tipped.

Forewing with white band anterior to cell, tapering to point at apex; proximal half of band margined anteriorly with dark brown line broadened at base; white band usually sprinkled with red; ground

uniform dark brown posterior to white band, sometimes with reddish hue posterior to A_1 fold; 10 veins; R_1 from well before upper outer angle of cell; R_2 free from cell or stalked with R_{3+4}; M_{2+3} fused. Hindwing brown or light brown, darker toward apex.

Male genitalia with uncus bearing well sclerotized ring, open anteriorly and forming pair of ventrally directed sharp-pointed spines. Gnathos (fig. 127) pi-shaped, transverse portion upturned and sharp, pointed laterally. Aedeagus with vesica bearing single sharply serrate inconspicuous cornutus.

Female genitalia as described for the genus.

Types.—In the American Museum of Natural History (lectotype); in the U.S. National Museum (lectoparatype).

Type data.—Lectotype male, hereby designated, Florida, collection G. D. Hulst; genitalia slide No. 3225, Carl Heinrich, June 14, 1946.

Lectoparatype: Male, Fernald collection, USNM 40079; genitalia slide No. 572, J. Shaffer, Nov. 23, 1965.

In the original description Hulst lists three males and two females from Florida.

Specimens examined.—90 ♂, 42 ♀.

Distribution (Map 11).—Atlantic and Gulf Coastal Plain, eastern Texas to Florida, north to North Carolina.

UNITED STATES: Alabama: Mobile Co., Theodore, 1 ♂, June 12, 1917, [CU].

Florida: Alachua Co., Gainesville, 1 ♂, 2 ♀, July 8, 1927 (J. Speed Rogers) [CU]; 1 ♂, July 10, 1927; 1 ♂, Apr. 22, 1952 (O. Peck) [CNC]; Charlotte Co., Punta Gorda, 2 ♀, Apr. 12, 1952 (G. S. Walley) [CNC]; Dade Co., Florida City, 2 ♂, Apr. 17, 1947 (Otto Buchholz) [ANS]; 1 ♂, Apr. 20, 1947; Homestead, 1 ♂, Feb. 24,1959 (D. O.Wolfenbarger) [CPK]; 1 ♂, Apr. 15, 1959; 1 ♂, Apr. 16, 1959; 2 ♂, July 17, 1959; 1 ♂, Feb. 22, 1955; 1 ♂, July 29, 1958; Royal Palm Hammock (also called Paradise Key, or Royal Palm State Park), Everglades National Park,1 ♂, Apr. 11 (F. M. Jones) [ANS]; 1 ♂, 1930; 1 ♂, Mar. 15, 1938 (E. P. Darlington) [ANS]; 1 ♂, Mar. 17, 1938; 1 ♂, Mar. 20, 1938; 2 ♂, 2 ♀, Apr. 2, 1952 (G. S. Walley) [CNC]; 1 ♀, Apr. 3, 1952; Flager Co., Pellicer Crk., 13 mi. north Bunnell, 1 ♀, May 8, 1954 (J. Bauer) [CM]; 1 ♂, Apr. 10, 1954; 1 ♀, Apr. 24, 1954; Highlands Co., Archbold Biol. Sta., 1 ♀, Apr. 27, 1947 (J. G. Needham) [CU]; 1 ♂, Apr. 28, 1947; 2 ♀, May 14, 1947; 2 ♀, June 17, 1964 (Jay C. Shaffer) [JCS]; 1 ♂, 3 ♀, June 18, 1964; 1 ♂, 1 ♀, June 20, 1964; 2 ♂, 1 ♀, June 22, 1964; 2 ♂, June 25, 1964; 2 ♂, 1 ♀, June 26, 1964; 2 ♂, June 28, 1964; 1 ♀, June 29, 1964; 1 ♀, July 2, 1964; 1 ♂, July 3, 1964; 1 ♂, July 5, 1964; 1 ♂, July 11, 1964; 1 ♀, July 12, 1964; 1 ♂, July 13, 1964; Hillsborough Co., Stemper, 1 ♂, Aug. 19, 1912 (G. Krautwurm) [CM]; 2 ♂, 1 ♀, Sept. 1, 1912; 2 ♂, Sept. 4, 1912; 2 ♂, Sept. 5, 1912; 2 ♂, Sept. 6, 1912; 1 ♂, Sept. 9, 1912; 1 ♂, 1 ♀, Sept. 13, 1912; 1 ♀, Oct. 1, 1912; 1 ♂, Oct. 8, 1912; 1 ♂, Oct. 9, 1912; 1 ♂, June 4 [CM]; 1 ♀, June 19 [CM]; Lake Co., Leesburg, 1 ♂, May 14, 1961 (C. H. Curran) [AMNH]; Manatee Co., Gulf Coast Exp. Sta., Bradenton, 1 ♂, May 11, 1955 (E. G. Keisheimer) [CPK]; Oneco, 1 ♀, May 5, 1953 (Paula Dillman) [CPK]; 1 ♂, May 8, 1953; 1 ♀, May 19, 1953; 1 ♂, May 25, 1953; 1 ♀, June 6, 1953; 1 ♂, 1 ♀, June 7, 1953; 1 ♀, June 10,

1953; 1 ♂, July 15, 1953; 1 ♂, Oct. 15, 1953; 1 ♂, June 1, 1954; 1 ♀, June 9, 1954; Pinellas Co., Dunedin, 1 ♂, Apr. 22, 1925 (W. S. Blatchley) [ANS]; 2 ♂, May 24, 1925; Sarasota Co., 1 ♂, May 7, 1946 (C. P. Kimball) [CPK]; 1 ♀, May 12, 1946; 1 ♂, May 19, 1946; Siesta Key, 1 ♀, May 21, 1956 (C. P. Kimball) [CPK]; St. Johns Co., Hastings, 6 ♂, 2 ♀, April [USNM]; 5 ♂, 1 ♀, May [USNM]; 3 ♂, 1 ♀, June [USNM]; 1 ♂, Sept. 30 [USNM]; county unknown, "Altmont," 1 ♀, Sept. 21, 1924 (F. R. Colo) [CU]; locality unknown, 1 ♂, no date [USNM].

Georgia: Charlton Co., 1 ♂, June 7, 1946 (Otto Buchholz) [ANS 1♂, June 9, 1946; 2♂, June 10, 1946; 1 ♂, June 11, 1946.

Mississippi: Jackson Co., Biloxi, 1 ♂, June 13, 1917 [CU].

North Carolina: Brunswick Co., Leland, 1 ♀, June 17, 1946 (Otto Buchholz) [ANS]; 2 ♂, June 20, 1946; 1 ♀, Sept. 2, 1946; Robeson Co., Maxton, 1 ♂, May 1–15, 1943 (A. B. Klots) [AMNH].

Texas: Burnet Co., 1 ♂, no date (F. G. Schaupp) [USNM]; Nueces Co. Corpus Christie, 1 ♂, Mar. 26, 1943 (W. M. Gordon) [CU].

Discussion.—In many specimens the distal one-half of each spine of the uncus ring is bent anteroventrally (fig. 127), and the anteriorly directed spine of the gnathos is posterior (fig. 127*a*) in relation to that of the type (fig. 127*b*). Specimens of both types have been collected at the Archbold Biological Station and do not represent geographical varieties. In view of the small differences between the two types, they are held to be conspecific.

Homosassa platella, new species

Figures 28, 93, 128

Diagnosis.—The broad flat transtilla and lack of a sclerotized ring on the uncus each will distinguish this species.

Description.—Maculation similar to that of *ella*. Forewing with 11 veins; M_{2+3} stalked.

Male genitalia with uncus lacking sclerotized ring.

Gnathos expanded into pair of large, flat, medially fused, posteriorly bicuspitate or tricuspitate plates. Juxta four-sided with medial V-shaped heavy sclerotization. Aedeagus with vesica bearing pair of weakly sclerotized sharply serrate cornuti.

Female unknown.

Types.—In the U.S. National Museum.

Type data.—Holotype, male, Hastings, Fla. (Saint Johns Co.), March, collection W. D. Kearfott; USNM 69385; genitalia slide No. 596, J. Shaffer, Apr. 26, 1966.

Paratypes: Three males, Hastings, Fla., collection W. D. Kearfott; two dated March, one male genitalia slide No. 103, J. C. S., Dec. 30, 1963; one dated April, male genitalia slide No. 493, J. Shaffer, Apr. 13, 1965.

Other specimens examined.—4 ♂.

Distribution (Map 11).—Known only from Florida.

UNITED STATES: Florida: Collier Co., Everglades, 1 ♂, Apr. 6, 1912 [AMNH]; Dade Co., Homestead, 1 ♂, Apr. 28, 1952 (J. R. Vockeroth) [CNC]; Pinellas Co., Dunedin, 1 ♂, Feb. 23, 1921 (W. S. Blatchley) [ANS]; Saint Johns Co., Hastings, 1 ♂, May [AMNH].

Homosassa incudella, new species

Figures 29, 94, 129, 165

Diagnosis.—The sclerotized ring of the uncus bears a pair of two-pointed processes rather than a simple process as in *ella*, or with the ring absent as in *platella*. Female specimens may be distinguished from those of *ella* by the presence of a dorsal invagination on the eighth abdominal segment.

Description.—Maculation similar to that of *ella*. Forewing with white costal band sewn with dark brown scales; 11 veins; M_{2+3} stalked.

Male genitalia with uncus similar to that of *ella*, but anterior processes of ring each anvil-shaped with sharp-pointed anterior and posterior processes. Gnathos with pair of subapical thickened processes, each bearing anterior and posterior spines. Aedeagus with vesica unarmed.

Female genitalia with dorsal invagination on eighth abdominal segment, and smaller invagination dorsally on the membrane between segments eight and nine.

Types.—In the Canadian National collection.

Type data.—Holotype, male, Lake Murray, Love and Carter Counties, Oklahoma, May 20, 1950, W. J. Reinthal, "339/50"; C.N.C. Type No. 9441; genitalia slide No. 546, J. Shaffer, July 15, 1965. A mass of glue supports the specimen on the pin from beneath, and I have added a small amount of glue beneath the right wings to support them.

Paratype: Female, data as given for the holotype; genitalia slide No. 548, J. Shaffer, July 16, 1965.

Other specimens examined.—None.

Distribution (Map 11).

Reynosa, new genus

Type.—*Atascosa floscella* Hulst, 1890.

Diagnosis.—The short, stout, sharp-pointed spicate processes of the uncus are diagnostic of the genus.

Description.—Frons conical; labial palpi porrect, about twice as long as eye diameter in males, about 2½ times in females; maxillary palpi reaching frons or nearly so, spreading; tongue not exposed between palpi; antennae filiform to subserrate in both sexes, compressed, ciliate ventrally, male shaft with two basal segments fused; ocelli present.

Forewing with 11 veins; R_2 usually free from cell, sometimes stalked with R_{3+4}; M_1 from upper outer angle of cell; M_{2+3} stalked about one-half their length, from lower outer angle; Cu_1 from just before the angle. Hindwing with 7 veins; Sc and Rs well stalked; M_1 from upper outer angle of cell; M_3 and Cu_1 long stalked, from lower outer angle; Cu_1 from cell very near to M_3 and Cu_1.

Male genitalia with uncus bearing pair of short apical lobes; spicate processes a pair of short, stout, sharp-pointed anteriorly directed, ventral hooks. Gnathos bearing small, sharp-pointed, posteriorly directed apical and pair of subapical hooks. Juxta subquadrate, anterior margin convex, posterior concave. Vinculum well developed, rounded. Valvae with cucullus membranous and projecting beyond costa; sacculus rather densely pilose. Aedeagus untapered, vesica unarmed.

Female genitalia with ovipositor compressed. Apophyses rather straight, anterior and posterior about equal in length. Ductus bursae short. Bursa unarmed, with long slender neck. Ductus seminalis from posterior end of bursa, slender.

***Reynosa floscella* (Hulst), new combination**

FIGURES 22, 95, 130, 166.

Atascosa floscella Hulst, 1890, pp. 210–211. — Smith, 1891, p. 85. — Hulst, 1902, p. 438. — Rindge, 1955, p. 162.

Poujadia floscella (Hulst). — Ragonot, 1901, p. 346. — Barnes and McDunnough 1917, p. 149. — McDunnough, 1939, p. 36.

Saluria floscella (Hulst). — Hampson, 1918, p. 96.

DIAGNOSIS.—This is the only known species in the genus.

DESCRIPTION.—Labial palpi with basal segments white, second and third segments brown to reddish brown on outer sides, white on inner sides; frons, occiput, patagia, and tegulae brown.

Forewing with ground light brown; costal area and cell white, sprinkled with reddish-brown scales; prominent dark brown orbicular spot and line extending posteriorly from spot to inner margin forming second spot on A_1 fold; dark brown transverse posterior beginning with prominent spot between M_1 and Cu_1, continuing to inner margin; terminal line of dark brown dots. Hindwing light brown on both sides.

Genitalia as described for the genus.

TYPES.—In the U.S. National Museum (lectotype); in the American Museum of Natural History (lectoparatype).

TYPE DATA.—Lectotype female, hereby designated, Blanco County, central Texas; Fernald collection; USNM 40078; genitalia slide No. 594, J. Shaffer, Apr. 23, 1966.

Lectoparatype: Male?, Blanco County, central Texas, collection G. D. Hulst; abdomen lost.

Specimens examined.—10 ♂, 12 ♀.

Distribution (Map 12).—Known only from Gulf Coastal Plain of Texas.

UNITED STATES: Texas: Cameron Co., Brownsville, 1 ♀, May 4, 1904 (H. S. Barber) [USNM]; 1 ♀, no date [USNM]; 1 ♂, Mar. 19, 1937 (T. N. Freeman) [CNC]; 2 ♂, Mar. 22, 1937; San Benito, 1 ♀, June 16–23 [USNM]; 1 ♀, July 8–15 [USNM]; 1 ♀, July 24–31 [USNM]; 1 ♀, August [USNM]; 1 ♀, Aug. 1–7 [USNM]; 1 ♂, 1 ♀, Sept. 8–15 [USNM]; 1 ♂, Mar 16–23 [USNM]; Fort Bend Co., Richmond, Brazos River, 1 ♂, June 22, 1917 [CU]; Nueces Co., Corpus Christie, 1 ♂, 2 ♀, Apr. 15, 1943 (W. M. Gordon) [CU]; 1 ♂ May 22, 1943; 1 ♀, June 4, 1943; 1 ♂, June 20, 1943; 1 ♂, 1 ♀, Sept. 25-Oct. 15, 1943.

Goya Ragonot

Goya Ragonot 1888, p. 43. [Type: *Goya albivenella* Ragonot, 1888. Designated by Hampson in Ragonot 1901, p. 349.]

Diagnosis.—The unusual male genitalia make this genus quite distinctive within the subfamily; the presence of a transtilla and lateral subrhomboid processes of the uncus are both unique to *Goya*.

Description.—Labial palpi about twice as long as eye diameter; tongue rudimentary; antennae with basal segments fused in male; eye large; ocelli present.

Forewing with 11 veins; R_2 free from cell near R_{3+4} or stalked with the latter; M_1 from upper outer angle of cell; M_{2+3} stalked, from lower outer angle. Hindwing with 7 veins; Sc and Rs well stalked; M_1 from upper outer angle of cell; M_3 and Cu_1 stalked, from lower outer angle; Cu_2 from cell very near to M_3 and Cu_1.

Male genitalia with uncus in form of pair of triangular plates, each joined on its anterior angle to a large subtriangular process which distally curves medially in tapering to a blunt point. Transtilla present, incomplete. Gnathos with medial process subquadrate in ventral view. Juxta rounded. Vinculum round to subtruncate. Valvae rectangular, apex rounded, inner half somewhat concave. Aedeagus short, compressed, with vesica unarmed.

Female genitalia with apophyses slender, rather straight. Bursa unarmed. Ductus seminalis from posterior end of bursa, slender.

Goya stictella (Hampson), new combination

Figures 23, 96, 131

Saluria stictella Hampson, 1918, pp. 96–97.

Diagnosis.—This species is easily distinguished from *albivenella* by the presence of dark brown spots on the forewing and by the absence of well-marked white tracing on the forewing veins.

Description.—Labial palpi porrect, basal segments white, second and third segments light brown on outer sides, third decumbent;

antennae sublaminate in male, light brown, basal segments bearing tuft of scales.

Forewing with M_{2+3} stalked for about one-half their length; ground light brown to grayish red, predominantly white anterior to cell; maculation variable; transverse anterior and median lines marked by dark brown spots in cell; A_1 with two prominent dark brown spots, one just distal to transverse anterior in the cell, other on the moderately well-developed transverse posterior; terminal line of dark brown spots. Hindwing with M_3 and Cu_1 long stalked.

Male genitalia with triangular plates of uncus each bearing on its terminal angle a posteromedially directed thorn. Gnathos with medial process bearing short sharp anterior and posterior spines on each lateral margin. Juxta broader than long. Aedeagus tapering strongly posteriorly.

Female genitalia as described for the genus.

TYPE.—In the British Museum (Natural History).

TYPE DATA.—Lectotype male, hereby designated, labeled as follows: "Type; Bahamas. M.C. Andros. 11. I. 1902 J.L. Bonhote. 1902–278; Saluria stictella Type ♂. Hmpsn.; Pyralidae Brit. Mus. Slide No. 10904."

SPECIMENS EXAMINED.—5 ♂, 2 ♀.

DISTRIBUTION (Map 4).—In the United States the species is known from Arkansas, Mississippi, and west central Florida.

UNITED STATES: ARKANSAS: Washington Co., Devel's Den State Park, 1 ♂, May 30, 1966 (R. W. Hodges) [USNM].

FLORIDA: Manatee Co., Oneco, 1 ♂, 1 ♀, June 13, 1954 (Paula Dillman) [USNM]; 1 ♀, Aug. 3, 1953; Sarasota Co., Siesta Key, 1 ♂, Apr. 2, 1952 (Charles P. Kimball) [CNC].

MISSISSIPPI: Harrison Co., Biloxi, 2 ♂, June 13, 1917 [CU].

DISCUSSION.—This is the only species of *Goya* known to occur in the United States; the type locality of *albivenella* is Argentina.

Subfamily Phycitinae Ragonot

The following seven genera which were previously placed in the Anerastiinae and a new genus, *Wakulla*, established for *Bandera carneella*, are transferred to the Phycitinae.

The relationships within the Phycitinae are clear for only a few of the eight genera. *Anerastia* and *Coenochroa* show affinities with each other but none with any particular group in the Phycitinae. *Barberia* is closely related to *Anderida*, and *Bandera* to *Anagasta*. The other four genera have typical phycitine genitalia, although their exact placement within the subfamily is uncertain. Of these four, *Ragonotia* and *Martia* are closely related and have typical phycitine wing maculation.

Anerastia Hübner

Anerastia Hübner [1816]–[1826], p. 367. — Ragonot, 1901, pp. 394–397. — Spuler, 1904, p. 200 — McDunnough, 1939, p. 36. [Type: *Tinea lotella* Hübner [1810]–[June 20, 1813.] Designated by Moore, 1886, p. 357.]

Prinanerastia Hampson, 1918, p. 80. [Type: *Tinea lotella* Hübner. Original designation.]

Diagnosis.—Anerastia and two other North American genera possess a toothed frons. In *Coenochroa* and *Martia* the teeth are borne at the end of a well-developed protuberance; in *Anerastia* they form a ring on an otherwise smooth frons.

Description.—Frons rounded, fine projecting serrations forming a transverse elliptical ring about one-half as wide as frons, vesture short; labial palpi deflexed, about 3½ times eye length in male, about four times in female; maxillary palpi rudimentary, minute; tongue reduced; antennae compressed, male shaft with basal segments fused, sublaminate, cilia about one-fifth segment width, female filiform, cilia minute, each segment bearing on its distal half several longer cilia, each about one-half segment width; ocelli well developed.

Forewings with 10 veins; R_1 from well before upper outer angle of cell; R_2 free, just before the angle; R_3 stalked for about one-half its length onto R_4; M_1 from below the angle; M_{2+3} fused, well separated from Cu_1; Cu_2 from well before Cu_1 at angle. Hindwing with 7 veins; Sc and Rs approximate beyond cell, then diverging; M_3 and Cu_1 stalked for over one-half their length, from lower outer angle of cell; Cu_2 from just below the angle.

Male genitalia with uncus bilobed, membranous medially. Gnathos complex, medial process stout, subrectangular, posteriorly bearing very short truncate lateral arms, mediodorsal process, and strong anteroventrally directed hook, dorsoanteriorly with large curved flat hook between uncus lobes. Transtilla crescent-shaped, poorly developed. Juxta elliptical, anterior margin sclerotized. Vinculum broadly rounded. Valvae tapering on distal third to bluntly pointed apex of costa, anterior-facing crescent-shaped ridge near base of tapering portion. Aedeagus with vesica bearing two large cornuti, one lance-shaped, the other deeply bicuspidate.

Female genitalia with ovipositor well sclerotized, tapering to bluntly pointed tip. Dorsum of eighth abdominal segment deeply incised medially. Apophyses well developed, anterior very slightly shorter than posterior. Ductus bursae moderate. Bursa unarmed. Ductus seminalis from posterior end of bursa.

Discussion.—This Old World genus is represented in North America by *lotella*, a species common in Europe.

Anerastia lotella Hübner

FIGURES 34, 48, 64, 97, 132, 167

Tinea lotella Hübner [1810]-[June 20, 1813].
Anerastia lotella Hübner [1826], p. 367. — Buckler, 1901, pp. 203–206, pl. 156, fig. 4. — Ragonot, 1901, pp. 397–398. — Spuler, 1904, p. 200, pl. 82, fig. 2. — Beirne, 1952, pp. 74–75, pl. 6, fig. 1.
Prinanerastia lotella (Hübner). — Hampson, 1918, p. 80.
Anerastia lobella [sic] (Hübner). — McDunnough, 1939, p. 36.

DIAGNOSIS.—This is the only North American species in the genus.

DESCRIPTION.—Labial palpi on outer sides varying brown to light brown, light orange, or orange; antennae orange brown; frons light brown, darker laterally, vertex and occiput brownish white dorsally, occiput laterally, patagia, tegulae, and dorsum of thorax brown to orange brown; legs brown to orange brown on outer sides, brownish white on inner sides.

Forewing varying brown to orange; veins white traced, sprinkled with brown; A_2 broadly sprinkled with brown; A_1 fold lightly white traced on outer half. Hindwings brown, fringe light brown.

Genitalia as described for the genus.

TYPE.—Lost.

TYPE LOCALITY.—Not given, but presumably Europe.

RECORDED HOSTS.— Poaceae: *Ammophila arenaria* (L.) Link (European beach grass), larvae feeding on roots near junction with stem; also on *Festuca ovina* L., *Secale cereale* L., (Rye) to which they are sometimes a serious pest, and *Aira* species, (Buckler).

SPECIMENS EXAMINED.— 152 ♂, 45 ♀.

DISTRIBUTION (Map 1).—Alaska (Fort Yukon) south to Washington, east to Minnesota.

UNITED STATES: ALASKA: near Fort Yukon, 1 ♂ [USNM].

MINNESOTA: Cass Co., Cass Lake, 1 ♂ June 18, 1934 (A. A. Granovsky) [UM]; 1 ♂, June 27, 1934; 2 ♂, July 27, 1936 (R. H. Daggy) [UM]; 1 ♂, Aug. 2, 1936; Cass Co., 1 ♂, June 24, 1937 (L. W. Orr) [UM]; 1 ♂, June 26, 1937; 2 ♂, June 30, 1937; 1 ♂, July 1, 1937 (P. M. Schroeder), 1 ♂, July 11, 1937 (L. W. Orr); 1 ♂, Aug. 11, 1937; Kittson Co., Hallock, 1 ♂, Aug. 9, 1935 (D. G. Denning) [UM]; 1 ♂, June 20, 1936; 3 ♂, June 21, 1936; 2 ♂, July 7, 1937; Polk Co., Crookston, 1 ♂, July 20, 1935 (D. G. Denning) [UM]; 1 ♂, July 21, 1935; 2 ♂, July 22, 1935; 1 ♂, July 27, 1935; 2 ♂, June 21, 1937; 1 ♀, June 23, 1937; 3 ♂, June 27, 1937; 1 ♂, June 26, 1937; 1 ♂, June 26, 1941; 1 ♂, June 27, 1941.

WASHINGTON: Walla Walla Co., Wallula, 1 ♂, July 30, 1948 (William C. Cook) [CNC].

CANADA: ALBERTA: Banff, 1 ♂, June 29, 1922 (C. B. D. Garrett) [CNC]; Dominion Range Sta. Manyberries, 1 ♂, July 10, 1951 (D. F. Hardwick) [CNC]; Scandia, 1 ♂, July 9, 1956 (E. E. Sterns) [CNC]; 1 ♂, July 10, 1956.

MANITOBA: Aweme, 1 ♂, July 26, 1914 (N. Criddle) [CNC]; 3 ♂, July 6, 1920; 1 ♂, 1 ♀, July 17, 1920; 1 ♂, 4 ♀, June 28, 1921; 1 ♂, 1 ♀, July 1, 1921; 1 ♀, (P. N. Vroom); 1 ♂, 6 ♀, July 2, 1921 (N. Criddle) [CNC]; 3 ♂, 4 ♀, July 6, 1921; 3 ♀, July 26, 1921; 1 ♂, July 28, 1921; 3 ♀, Aug. 3, 1921 (P. N. Vroom) [CNC];

1 ♂, Aug. 10, 1921 (N. Criddle) [CNC]; 1 ♂, Aug. 25, 1921; 3 ♂, 3 ♀, June 13, 1922; 2 ♀, June 23, 1922; 2 ♂, June 27, 1922; 1 ♀, July 19, 1922; 1 ♂, July 22, 1922; 2 ♂, Sept. 15, 1923; 1 ♂, July 11, 1925; 1 ♂, Aug. 10, 1925; 1 ♀, Aug. 21, 1925; 3 ♂, 2 ♀, July 2, 1926; 1 ♀, Aug. 11, 1926; 7 ♂, July 20, 1928; Brandon, 1 ♂, June 27, 1958 (R. B. Madge) [CNC]; 1 ♂, July 6, 1958 (R. L. Hurley) [CNC]; 1 ♀, July 7, 1958 (R. B. Madge) [CNC]; 1 ♂ July 8, 1958; 5 ♂, 2 ♀, July 17, 1958; (R. L. Hurley) [CNC]; 2 ♀, July 20, 1957 (R. B. Madge) [CNC]; 1 ♂, July 31, 1958 (R. L. Hurley) [CNC]; 1 ♀, Aug. 7, 1958 (R. B. Madge) [CNC]; Glenboro, 38 ♂, "Spruce-sand community," June 17, 1958 (R. L. Hurley) [CNC]; Ninette, 1 ♂, "Maple-Elm floodplain community," June 17, 1958; Wabowden, 1 ♂, Aug. 7, 1949 (J. B. Wallis) [CNC].

Northwest territories: Bathurst Inlet, 1 ♀, July 28, 1951 (W. I. Campbell) [CNC]; Hay River, 2 ♂, July 30, 1951 (P. R. Ehrlich) [CNC]; 1 ♂, July 31, 1951.

Quebec: Forestville, 1 ♂, July 11, 1950 (R. deRuette) [CNC].

Saskatchewan: Attons Lake, Cut Knife, 1 ♂, June 23, 1940 (A. R. Brooks) [CNC]; 6 ♂, July 11, 1940; 2 ♂, 1 ♀, July 12, 1940; Rutland, 5 ♂, July 15, 1940 (A. R. Brooks) [CNC]; 1 ♂, Aug. 2, 1940; Saskatoon, 1 ♂, June 26, 1923 (Kenneth M. King) [CNC]; 1 ♂, July 2, 1923; 2 ♂, July 7, 1923; 1 ♂, July 21, 1923; Waskesiu Lake, 1 ♀, July 11, 1939 (A. R. Brooks) [CNC]; 2 ♂, July 13, 1939; 2 ♂, 1 ♀, July 15, 1939; 1 ♂, July 18, 1939; 2 ♂, 1 ♀, July 21, 1939.

Coenochroa Ragonot

Coenochroa Ragonot, 1887, p. 20; 1889, p. 117, — Hulst, 1890, p. 217. — Smith, 1891, p. 85. — Ragonot, 1901, pp. 418–419. — Hulst, 1902, p. 441. — Barnes and McDunnough, 1917, p. 150.—Hampson, 1918, p. 58.—McDunnough, 1939, p. 36. [Type: *Coenochroa californiella* Ragonot, 1887. Original designation.]

Petaluma Hulst, 1888, p. 116; 1890, pp. 215–216. — Smith, 1891, p. 85. — Hulst, 1902, p. 440. [Type: *Anerastia illibella* Hulst, 1887. Original designation.]

Alamosa Hampson *in* Ragonot, 1901, p. 369. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 65. — McDunnough, 1939, p. 36. [New synonymy.] [Type: *Alamosa piperatella* Hampson *in* Ragonot, 1901. Monobasic.]

Diagnosis.—The genus may be easily recognized by the combination of a toothed protuberant frons and longitudinal wing pattern. *Martia* has a somewhat similar frons, but the wing pattern is predominantly transverse. The wing maculation of *Anerastia* is similar to that of *Coenochroa*, and the frons is toothed, but not protuberant. The bifid male uncus is unique to *Coenochroa*.

Description.—Frons with prominent anterior protuberance terminating in dorsoposteriorly sloping closed rim of irregular teeth surrounding central beak (figs. 44–47); labial palpi porrect or deflexed; maxillary palpi rudimentary, naked, usually hidden by labials; tongue reduced, usually hidden by palpi; antennae compressed, each segment bearing pair of perpendicularly projecting cilia ventrally near distal end, male shaft scaled dorsally, ventrally and laterally bearing dense fine recurved cilia, female shaft scaled dorsally and laterally, ventrally with fine sparse recurved cilia; ocelli small, covered with scales.

Forewings with 10 veins; vein Cu_2 from before lower outer angle of cell; Cu_1 and M_3 from angle, stalked; M_2 absent; M_1 from upper outer angle of cell; R_{2+4} stalked, from just before the upper outer angle; R_1 from well before angle. Hindwing with 6 or 7 veins; vein Cu_2 from before lower outer angle of cell; Cu_1 and M_3 from angle, stalked for at least one-half their length, sometimes fused; M_2 absent; M_1 from just below upper outer angle of cell; Rs and Sc from upper angle, stalked for at least one-half their length.

Male genitalia with uncus bifid, setose ventrally, terminating in minute ventrally directed hook. Gnathos with medial process U-shaped. Transtilla absent. Juxta membranous, margin sclerotized anteriorly. Vinculum variable, U-shaped or V-shaped, anteriorly rounded or bluntly pointed. Valvae broadly rounded, variable in outline, setose distally. Aedeagus tapering posteriorly, vesica armed.

Female genitalia with ovipositor lobes triangular, moderately setose. Apophyses rather straight and uniform. Ductus bursae moderately broad. Bursa slender and unarmed. Ductus seminalis leaving near midpoint of ductus bursa.

Key to the Species of Coenochroa Based Upon External Structure

1. Central beak of frons protruding beyond rim (figs. 45, 46); costa paler than cell; R_2 usually first to branch from stalked R_{2+4} . . . . . **illibella**
   Central beak of frons not protruding beyond rim; costa not pale; R_4 usually first to branch from stalked R_{2+4} 2
2. Central beak of frons with irregular tip, just attaining end of rim (fig. 47); Atlantic and Gulf Coastal Plain . . . . . **bipunctella**
   Central beak of frons pointed and small, not attaining end of rim (fig. 44); Texas and Western United States . . . . . **californiella**

Coenochroa californiella Ragonot

FIGURES 41, 44, 65, 98, 133, 168

Coenochroa californiella Ragonot, 1887, p. 20; 1889, p. 117. — Hulst, 1890, p. 217. — Smith, 1891, p. 85. — Ragonot, 1901, p. 420. — Hulst, 1902, p. 441. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 59. — McDunnough, 1939, p. 36.

Coenochroa inspergella Ragonot, 1887, p. 20; 1889, p. 117. — Hulst, 1890, p. 216. — Smith, 1891, p. 85. — Ragonot, 1901, p. 419. — Hulst, 1902, p. 440. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 59. — McDunnough, 1939, p. 36. [New synonymy.]

DIAGNOSIS.—This is the only member of the genus in which the central beak of the frons does not attain the rim. The genitalia are identical to those of *illibella*, a species which lacks the discal spot and has a distinctive pale costa.

DESCRIPTION.—Frons with protuberance cylindrical, ventrally about as long as wide, rim slanting about 45°, teeth projecting forward, central beak a very small cone not reaching rim, vesture light

brown dorsally, white ventrally; labial palpi deflexed, basal segments white, second and third uniform light yellow, occasionally brown dorsally; antennae light brown, finely ciliate; patagia, tegulae, vertex, occiput, and legs varying light yellow to brown.

Forewing radius varying from about 8 mm to 12 mm, average of 9.5 mm; ground color light yellow to orange yellow; veins usually traced with white, often sprinkled with black scales; dark discal spot at lower outer angle of cell; vein R_2 usually first to leave stalked R_{2+4}.

Male genitalia with aedeagus slender, slightly thicker anteriorly, vesica with a single slender conutus.

Female genitalia with ductus seminalis slender, not thickened basally.

TYPES.—*C. californiella* and *C. inspergella*, in the Muséum National d'Histoire Naturelle.

TYPE DATA.—*C. californiella*, lectotype male, hereby designated, Walsingham, genitalia slide No. 536, J. Shaffer, June 20, 1965. In the original description the type locality is given as California.

C. inspergella, lectotype male, hereby designated, Arizona, Morrison, 1881, genitalia slide No. 537, J. Shaffer, June 20, 1965.

SPECIMENS EXAMINED.—260 ♂, 133 ♀.

DISTRIBUTION (Map 2).—British Columbia south to California, east to Kansas and Texas.

UNITED STATES: ARIZONA: Cochise Co., Carr Canyon, Huachuca Mts., 2 ♂, June 3, 1952 (M. Cazier, W. Gertsch, R. Schrammel) [AMNH]; Ft. Grant, Pinaleno Mts., 1 ♀, July 15–19, 1917 (C. U. Biol. Expend.) [CU]; Huachuca Mts., 1 ♂, May 1–7 [USNM]; 1 ♀, August 8–15; Montezume Pass, Huachuca Mts. (6500 ft.), 1 ♂, Sept. 7, 1950 (T. Cohn, P. Boone, M. Cazier) [AMNH]; Paradise, 1 ♂, March [USNM]; Paradise, 1 ♀, July (Poling) [CM]; 1 ♂, 3 ♀, August; Portal, 1 ♀, June 1, 1952 (M. Cazier, W. Gertsch, R. Schrammel) [AMNH]; San Bernardino Ranch (3750 ft.), 1 ♀, August (F. H. Snow) [UK]; Southwestern Research Sta., 5 mi. west of Portal (5400 ft.), 1 ♂, Apr. 10, 1956 (Cazier, Ordway) [AMNH]; 1 ♂, Apr. 22, 1956; 1 ♂, Apr. 23, 1956; 1 ♂, Apr. 25, 1956; 2 ♂, May 16, 1956 (M. Statham); 1 ♂, 2 ♀, May 18, 1956; same locality, 1 ♀, July 28, 1959 (E. G. Linsley) [UCB]; same locality, 1 ♀, July 26–Aug. 3, 1959 (A. B. Klots) [ABK]; same locality, 1 ♀, Nov. 1, 1959 (J. R. Powers) [UCB]; 1 ♂, Nov. 2, 1959; same locality, 1 ♂, May 16, 1960 (Carl W. Kirkwood) [CPK]; 1 ♂, May 18, 1960; 1 ♀, May 25, 1960; 1 ♂, May 18, 1960; 1 ♀, May 25 1960; 1 ♂, May 28, 1960; 1 ♂, May 29, 1960; 1 ♂, Apr. 10, 1961; 1 ♂, Apr. 12, 1961; 1 ♂, Apr. 13, 1961; 1 ♂, Apr. 17, 1961; same locality, 1 ♀, Apr. 23, 1961 (M. A. Cazier) [AMNH]; 1 ♂, Apr. 25, 1961; 1 ♀, May 2, 1961; same locality, 1 ♂, 2 ♀, May 10, 1961 (Gertsch & Cazier) [AMNH]; 1 ♂, 1 ♀, May 15, 1961 (M. Cazier); 1 ♂, May 27, 1961 (M. Statham); same locality, 1 ♂, Apr. 10, 1962 (Carl W. Kirkwood) [CNC]; 4 ♂, Apr. 15, 1962; 1 ♂, Apr. 16, 1962; 1 ♂, Apr. 18, 1962; 1 ♂, Apr. 19, 1962; 2 ♂, Apr. 20, 1962; 1 ♂, Apr. 21, 1962; 2 ♂, Apr. 22, 1962; 1 ♂, Apr. 23, 1962; 1 ♂, Apr. 27, 1962; same locality, 1 ♂, Aug. 23, 1962 (M. Statham) [AMNH]; 1 ♂, Aug. 30, 1962; Coconino Co., Flagstaff, 2 ♂, no date (H. S. Barber) [USNM]; Gila Co., vicinity Globe, 3 ♀, Aug. 4–5, 1937 (A. B. Klots) [AMNH]; Globe, 1 ♂, May 18, 1950 (E. C. Johnston)

[CNC]; San Carlos, 1 ♂, May 12–13 (1918 (J. C. Bradley) [CU]; no locality, 1 ♀, no date (O. C. Poling) [USNM]; Maricopa Co., New River, 1 ♂, May 7, 1950 (E. C. Johnston) [CNC]; Tempe, 1 ♂, Apr. 19, 1920 (E. V. Walter and H. L. Arnold) [USNM]; 1 ♂, Apr. 26, 1920; 1 ♀, May 3, 1920; 1 ♀, July 26, 1920; 1 ♀, Sept. 27, 1920 (E. V. Walter); Pima Co., Baboquivari Mts. (5–7000 ft.), 1 ♂, July 15–30, 1923 (O. C. Poling) [USNM]; 1 ♀, July 27–31, 1923; 1 ♂, 1 ♀, Aug. 1–4, 1923; 3 ♀, Aug. 1–15, 1923; 3 ♂, 7 ♀, Aug. 15–30, 1923; 1 ♀, Sept. 1–15, 1924; 1 ♂, Sept. 15–30, 1924; 11 ♂, 12 ♀, Oct. 1–15, 1924; 9 ♂, 1 ♀, Oct. 15–30, 1924; 1 ♂, Nov. 1–15, 1924; Baboquivari Mts., 3 ♂, 2 ♀, Apr. 23, 1938 (J. A. Comstock) [LACM]; 4 ♂, 5 ♀, Apr. 24, 1928; 14 ♂, 1 ♀, Apr. 25, 1938; 1 ♂, 2 ♀, Apr. 26, 1938; Baboquivari Mts., 1 ♀, no date (F. H. Snow) [UK]; Madera Canyon, Santa Rita Mts. (4400 ft.), 2 ♂, 2 ♀, May 26, 1963 (J. G. Franclemont) [JGF]; 1 ♀, June 2, 1963; 1 ♀, June 4, 1963; Pinal Co., Oracle, 1 ♀, May 19, 1933 (Grace H. and John L. Sperry) [AMNH]; 1 ♂, June 4, 1935, [USNM]; [CUC]; 1 ♀, [AMNH]; 3 ♀, June 5, 1935 [AMNH]; Boyce Thompson Arboretum, Superior, 1 ♀, Aug. 1, 1937 (A. B. Klots) [AMNH]; Santa Curz Co., Madera Canyon, Santa Rita Mts., 1 ♂, Aug. 15, 1949 (Lloyd M. Martin) [LCAM]; (5800 ft.), 1 ♀, June 22, 1955; Madera Canyon, Santa Rita Mts., 1 ♂, Aug. 24–Sept. 2, 1957 (William A. Hammer) [LACM]; same locality (4880 ft.), 1 ♂, Apr. 14, 1963 (J. G. Franclemont) [JGF]; 1 ♂, May 20, 1963; 1 ♂, May 21, 1963; 1 ♀, May 28, 1963; 1 ♀, June 1, 1963; Santa Rita Mts., 4 ♀, Aug. 22, 1946 (J. A. Comstock and Lloyd M. Martin) [LACM]; 2 ♀, Aug. 24, 1946; 1 ♀, Aug. 27, 1946; 1 ♀, Aug. 29, 1946; Nogales, 1 ♀, May 30, 1899 [USNM]; Nogales, 2 ♂, 3 ♀, May 24–30 [USNM]; 1 ♂, 2 ♀, June 1–7; 1 ♂, July 8–15; Pena Blanca (3950 ft.), 1 ♀, June 7, 1963 (J. G. Franclemont) [JGF]; Yavapai Co., 10 mi. east of Congress, 1 ♀, Aug. 22–23, 1927; Mayer, 3 ♂, 1 ♀, May 21, 1959 (M. O. Glenn) [MOG]; Prescott, 6 ♂, May 6, 1950 (E. C. Johnston) [CNC]; no county, "Catal Spgs," 2 ♀, (E. A. Schwarz) [USNM]; Fish Creek, Tonto Nat. For., 5 ♂, 3 ♀, May 9–10, 1918 (J. G. Bradley) [CU]; Todd's Lodge, Oak Creek Canyon, 1 ♂, June 12, 1941 (Grace H. and John L. Sperry) [CNC]; Santa Rita Mts., 1 ♂, 1 ♀, May 21, 1898 (E. A. Schwarz) [USNM]; 1 ♀, May 26, 1898; 1 ♂, June 8, 1898; 1 ♀, June 13 1898; 1 ♀, June 14, 1898; Santa Rita Mts. (5–8000 ft.), 1 ♂, June (F. H. Snow) [UK]; no locality, 1 ♂, no date (Morrison), labeled "Coll. Ragonot 95–85" [BM]; no locality, 1 ♂, 1881 (Morrison) [USNM]; no locality, 1 ♂, August (O. Poling) [USNM]; 6 ♂, September (Poling) [CM]; 1 ♂, no date, from Fernald collection [USNM]; 1 ♂, no date, from C. V. Riley collection [USNM]; 1 ♂, 1 ♀, no date [USNM].

California: Inyo Co., Bishop, 2 ♂, June 14, 1937 (E. C. Johnston) [CNC]; Lassen Co., Ravendale, 1 ♀, June 20, 1959 (G. I. Stage) [ABK]; Modoc Co., Canby, 3 ♂, July 16, 1936 (E. C. Johnston) [CNC]; Orange Co., Fullerton, 2 ♀, Nov. 14, 1962 (C. A. Toschi) [UCB]; Riverside Co., Rancho La Sierra, Arlington, 1 ♂, Aug. 26, 1949 (A. H. Rindge) [AMNH]; 1 ♂, Aug. 23, 1952; Idyllwild, 1 ♂, May 13, 1937 (H. Little) [AMNH]; Lake Hemet, 6 ♂, June 9, 1937 (E. C. Johnston) [CNC]; Riverside, 1 ♂, May 4, 1926 (Grace H. and John L. Sperry) [CPK]; 1 ♂, Sept. 28, 1931 (C. H. Dammers) [USNM]; 1 ♂, 1931; 1 ♀, May 4, 1934 (Grace H. and John L. Sperry) [CPK]; 2 ♂, May 23, 1935 (Grace H. and John L. Sperry) [AMNH], [CNC]; 1 ♂, 1 ♀ [AMNH]; 1 ♂, July 12, 1935 (Grace H. and John L. Sperry) [AMNH]; 1 ♂, Apr. 29, 1936 [CNC]; 1 ♂, Apr. 27, 1937 (H. Buckwalter) [AMNH]; 3 ♂, June 1, 1939 [AMNH]; San Bernardino Co., Barton Flats, 2 ♂, June 27, 1946 [AMNH]; Upper Santa Ana River, 1 ♀, June 2, 1946 [AMNH]; 1 ♂, July 10, 1946; 1 ♂, July 18, 1946;

1 ♂, Aug. 18, 1948 (Melander); San Diego Co., Mt. Palomar, 3 ♂, July 18, 1963 (J. Powell) [UCB]; Mt. Palomar St. Pk., 1 ♂, July 12, 1953 (W. J. and J. W. Gertsch) [AMNH]; San Diego, 1 ♂, June 16, 1912 (George H. Field) [ASNM]; Julian, 2 ♀, no date [USNM]; Siskiyou Co., Indian Butte, 1 ♂, July 16, 1936 (E. C. Johnston) [CNC]; county unknown, Hathaway Creek, San Bernardino Mts., 2 ♂, Aug. 2, 1940 (J. A. Comstock and C. Henne) [LACM].

Idaho: Canyon Co., Parma, 1 ♂, July 6, 1951 (A. J. Walz) [AMNH].

Nevada: Clark Co., Kyle Canyon, Charleston Mts., 1 ♀, Apr. 26, 1950 (E. C. Johnston) [CNC]; Wheeler's Spring, Charleston Mts., 2 ♂, May 14, 1934 [CPK].

New Mexico: Bernalillo Co., Albuquerque, 1 ♀, July 21, 1902 (Oslar) [USNM]; 1 ♀, July 24, 1902; 1 ♂, ♀, no date [UK]; Hidalgo Co., Rodeo, 1 ♀, Nov. 7, 1959 (J. R. Powers) [UCB]; county unknown, "so. N. Mex.," 1 ♂, 1 ♀, Aug. 23–30 (Poling), Rothschild Bequest B.M. 1939–1 [BM].

Texas: Blanco Co., 1 ♀, no date, G. D. Hulst [AMNH]; Brewster Co., Alpine, 1 ♀, May 22, 1950 (E. C. Johnston) [CNC]; Burnet Co., 2 ♂, 2 ♀, no date (F. G. Schaupp) [USNM]; Carmeron Co., Brownsville, 2 ♀, May 31, 1904 (H. S. Barber) [USNM]; 1 ♀, June 3, 1904; 1 ♂, June [UK]; 2 ♂, June [ANS]; Hidalgo Co., Mercedes, 1 ♀, Aug. 31, 1958 (H. Smalzried) [AMNH]; 1 ♂, no date [CPK]; Jeff Davis Co., Limpia Canyon, 8 ♂, 2 ♀, May 20, 1950 (E. C. Johnston) [CNC]; Randall Co., Palo Duro Canyon St. Pk., 3 ♂, May 5, 1961 (Lloyd M. Martin, Robert H. Reid, William A. Rees, Robert J. Ford) [LACM]; 3 ♂, May 6, 1961; 3 ♂, May 8, 1961; 1 ♀, May 9, 1961; 3 ♂, 1 ♀, May 11, 1961; 1 ♀, May 12, 1961.

Utah: Utah Co., Vineyard, 2 ♂, July 7, 1917 (Tom Spalding) [ANS]; 1 ♂, July 11, 1917; 1 ♂, Aug. 6, 1917.

Washington: Adams Co., Othello, 1 ♂, June 23, 1959 (R. F. Harwood) [USNM]; 1 ♂, July 9, 1959; Chelan Co., First Creek, 2 ♂, July 2, 1949 (E. C. Johnston) [CNC]; Grant Co., Dry Falls, 1 ♂, June 30, 1949 (E. C. Johnston) [CNC]; Quincy, 1 ♂, July 5, 1959 (C.S. Crawford) [USNM]; Okanogan Co., Black Canyon, 4 ♂, July 1, 1949 (E. C. Johnston) [CNC]; Walla Walla Co., Walla Walla, 1 ♂, June 27, 1935 (H. P. Lanchester) [USNM]; Whiteman Co., Snake River, opposite Clarkston, 1 ♂, May 29, 1931 (J. F. Clarke) [USNM]; Yakima Co., Yakima, 1 ♂, June 8, 1931 (Fred Dauy) [USNM]; 1 ♂, Sept. 11, 1955 (A. I. Good) [AMNH].

CANADA: British Columbia: Kamloops, 1 ♀, June 28, 1937 (J. K. Jacob) [CNC]; Oliver (1500 ft.), 1 ♂, June 5, 1953 (D. F. Hardwick) [CNC]; 7 ♂, June 16, 1953; 13 ♂, June 17, 1953; (2500 ft.), 3 ♂, June 26, 1953; (1000 ft.), 1 ♂, July 9, 1953 (J. E. H. Martin) [CNC]; (2500 ft.), 2 ♂, July 10, 1953 (D. F. Hardwick) [CNC]; Osoyoos, 1 ♂, May 19, 1923 (C. B. Garrett) [CNC]; (1200 ft.), 1 ♀, July 22, 1953 (D. F. Hardwick) [CNC].

Discussion.—The degree of black scaling on the forewings is quite variable and ranges from a very marked broad tracing of the veins to an almost total absence of black scales. The type specimen of *californiella* is very sparsely set with black scales and that of *inspergella* rather heavily so, thus it is not surprising that they were regarded as representing separate species. Wing venation, frons, and genitalia are essentially identical in the two holotypes.

Small specimens may easily be mistaken for *bipunctella*.

***Coenochroa illibella* (Hulst)**

FIGURES 39, 40, 45, 67, 134, 169

Anerastia illibella Hulst, 1887, p. 138.—Rindge, 1955, p. 164.
Coenochroa puricostella Ragonot, 1887, p. 20.
Coenochroa illibella (Hulst).—Ragonot, 1889, p. 117; 1901, p. 419.—Barnes and McDunnough, 1917, p. 150.—Hampson, 1918, p. 58.—McDunnough, 1939, p. 36.
Alamosa piperatella Hampson in Ragonot, 1901, pp. 369–370.—Barnes and McDunnough, 1917, p. 149.—Hampson, 1918, p. 65.—McDunnough, 1939, p. 36. [New synonomy.]

DIAGNOSIS.—The species may be recognized by either the pale costal region of the forewing, the compressed and protruding central beak of the frons, the absence of a discal spot, or the fact that R_2 is almost always the first vein to leave the stalked R_{2+4}.

DESCRIPTION.—Frons with protuberance cylindrical, ventrally about as long as wide, rim slanting at about 45°, teeth projecting forward, central beak strongly compressed, protruding well beyond rim, vesture light brown dorsally, white ventrally; labial palpi somewhat deflexed, basal segments white, second and third brown on outer sides and dorsally, light brown to white ventrally; antennae as in *californiella;* patagia, tegulae, vertex, occiput, and legs as in *californiella.*

Forewing radius averaging about 8.8 mm; area anterior to cell white, sometimes variously sprinkled with black scales; region posterior to radius quite variable, usually grayish orange sprinkled with black scales predominantly on veins; area between veins sometimes white, veins never traced with white; vein R_2 first to branch from R_{2+4}. Hindwing with fringe white.

Genitalia as in *californiella.*

TYPES.—*A. illibella,* in the American Museum of Natural History; *C. puricostella,* in the Museum National d'Histoire Naturelle; *A. piperatella,* in the British Museum (Natural History).

TYPE DATA.—*A. illibella,* lectotype female, hereby designated, Blanco Co., central Texas, November, collection G. D. Hulst, genitalia slide No. 3227, Carl Heinrich, June 14, 1946. In the original description Hulst reports only that he had two males and one female from Texas.

C. puricostella, lectotype male, hereby designated, Arizona, Morison, genitalia slide No. 538, J. Shaffer, June 20, 1965.

A. piperatella, lectotype male, hereby designated, labeled as follows: "Syntype; Colorado Ameriq. sept.; Coll. Ragonot, 95—85.; Alamosa piperatella Rag. Colorado ex Coll. Rag; ♂ genitalia slide I–4–1967 J. Shaffer No. 706."

SPECIMENS EXAMINED.—104 ♂, 56 ♀.

DISTRIBUTION (Map 2).—Ontario west to Alberta and Washington, south to California and Texas.

UNITED STATES: ARIZONA: County unknown, "Br't Angel," 1 ♂, no date [USNM].

CALIFORNIA: Inyo Co., 7 mi. north Parcher's Camp, 4 ♂, June 30, 1961 (J. Powell) [UCB]; Mono Co., Leevining, 2 ♂, July 19, 1938 (E. C. Johnston) [CNC]; 1 ♂, July 20, 1938; 1 mi. southwest Tom's Place, 1 ♂, 2 ♀, Aug. 10, 1963 (C. A. Toschi) [UCB]; 1 ♂, Aug. 13, 1963 (M. J. Tauber and C. A. Toschi).

COLORADO: Adams Co., Watkins, 8 ♂, July 4–5, 1927 [CU]; Boulder Co., Boulder, 1 ♂, June–August, 1896 [BMNH]; Chaffee Co., Salida, 1 ♂, July 9, 1937 [AMNH]; Denver Co., Denver, 1 ♂, no date [USNM]; 2 ♂, (Oslar); Prowers Co., Lamar, 2 ♂, Sept. 24, 1945 (E. C. Johnston) [CNC]; county unknown, 1 ♂, no date (Oslar) [USNM]; 1 ♂, no date [AMNH]; 6 ♂, no date [USNM].

KANSAS: Clark Co. (1962 ft.), 1 ♀, June (F. H. Snow) [ANS]; 1 ♂ [UK]; 2 ♀ [USNM].

NEW MEXICO: Eddy Co., Artesia, 2 ♂, May 13, 1950 (E. C. Johnston) [CNC] Sandoyal Co., Frijoles Canyon, Bandelier Nat. Mon., 1 ♂, July 9–11, 1957; (A. B. Klots) [AMNH]; (6050 ft.), 4 ♂, July 17, 1962 (E. and I. Munroe) [CNC]; Otero Co., Mescalero, 1 ♂, May 12, 1950 (E. C. Johnston) [CNC]; Dona Ana Co., Mesilla, 1 ♀, July 30 (Cockerell) [BM]; Mesilla Park, 1 ♂, 1 ♀, May 8 (Cockerell) [USNM]; 3 ♂, 3 ♀, May 13; 2 ♂, (3800 ft.) [CNC]; 1 ♂, May 22 (Cockerell) [CNC]; 1 ♂ [USNM]; 1 ♀, June 8; 1 ♀, July 8; 1 ♀, Aug. 29; 1 ♀, no date; 1 ♀ [CNC]; Mesquite near Mesille Park, 1 ♀, July 12, 1917 [CNC]; 5 ♂ [CU]; Grant Co., Silver City, 1 ♂, May 25, 1913 (J. B. Wallis) [CNC]; 1 ♀, May 27 1913; 1 ♀, July 25, 1913; 4 ♂, 3 ♀, July 26, 1913; 2 ♂, July 27, 1913; 7 ♂, 1 ♀, July 28, 1913; county unknown, southern New Mexico, 2 ♀, Aug. 23–30 (Poling) [BM].

NORTH DAKOTA: Ransom Co., 1 mi. southeast McLeod, 1 ♂, July 19, 1963 (J. R. Powers) [UCB].

SOUTH DAKOTA: Davison Co., Mitchell, 1 ♂, Sept. 14, 1945 (E. C. Johnston) [CNC].

TEXAS: Reeves Co., Pecos, 2 ♂, 17 ♀, May 18, 1950 (E. C. Johnston) [CNC]; 1 ♂, 8 ♀, June 2, 1950; county unknown, 1 ♀, no date, labeled, "Fernald Collection," "U.S.N.M. Type No. 40077," "*Petaluma illibella* Hulst, Type," "*Anerastia illibella* Hulst, Type" [USNM].

UTAH: Garfield Co., 11 mi. southeast Panguitch (7200 ft.), 4 ♂, July 11, 1960 (F., P., and B. Rindge) [AMNH]; 3 ♂, July 12, 1960; 5 ♂, July 13, 1960; Tooele Co., Stockton, 1 ♀, Aug. 8, 1904 (Tom Spalding) [USNM]; 1 ♀, no date; Utah Co., Vineyard, 1 ♂, Aug. 6, 1917 (Tom Spalding) [ANS]; 1 ♀, July 16, 1917.

WASHINGTON: Grant Co., Quincy, 1 ♂, July 1, 1959 (C. S. Crawford) [USNM]; 1 ♂, July 5, 1959.

CANADA: ALBERTA: Medicine Hat, 1 ♂, July 15, 1956 (E. E. Sterns) [CNC]; Scandia, 1 ♂, July 6, 1956 (E. E. Sterns) [CNC].

ONTARIO: Marmora, 1 ♀, Aug. 16, 1952 (J. F. McAlpine) [CNC]; Point Pelee 1 ♂, 1 ♀, June 29, 1927 (F. P. Ide) [CNC].

DISCUSSION.—The original description of *illibella* lists two males and one female from Texas. The disposition of the male types is not known, and two female specimens from Texas bear Hulst's "Type" label. Available evidence is insufficient to determine which, if either, of these two females was included in the original series, and I have

designated as lectotype the specimen in the American Museum of Natural History. The remaining female is deposited in the U.S. National Museum, full data being given above.

The specimens from Pecos, Tex. are atypical in that the frons beak is unusually well developed and the rim is flared anteriorly so that the teeth point somewhat anterolaterally. Most of the Pecos specimens are only sparsely set with black scales on the forewings, but otherwise are typical of the species.

Coenochroa bipunctella **(Barnes and McDunnough), new combination**

FIGURES 42, 47, 66, 135, 170

Alamosa bipunctella Barnes and McDunnough, 1913, p. 184; 1917, p. 149. — Grossbeck, 1917, p. 134. — Hampson, 1918, p. 65. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

DIAGNOSIS.—This is the only member of the genus having numerous small cornuti on the vesica of the male rather than a single one. The ductus seminalis of females is thickened where it leaves the ductus bursa, not slender as in other species. Otherwise, specimens could be confused with small examples of *californiella*, which has similar wing venation and maculation, but the two species are largely or wholly allopatric.

DESCRIPTION.—Frons with protuberance cylindrical, ventrally about as long as wide, rim slanting at about 45°, teeth projecting forward, central beak conical with irregular tip even with end of rim, vesture light brown to brown dorsally, white to light brown ventrally; labial palpi usually porrect, basal segments white, second and third brown dorsally and on outer sides, light brown ventrally; antennae as in *californiella*; patagia and tegulae brown, vertex and occiput light brown dorsally, occiput brown dorsolaterally, white below middle of eye; legs brown on outer sides, white on inner sides.

Forewing radius averaging about 6.9 mm; cell, discocellular, radials, medials, cubitals, and anal veins each traced with a broad white band sprinkled with black scales; area anterior to cell varying yellow to brown and sprinkled with black scales; ground color yellow to yellow brown; prominent black discal spot at lower outer angle of cell; brown on underside; vein R_4 first to branch from stalked R_{2+4}. Hindwing bordered with double brown line; fringe white; ground color light brown, darker in apical area; Cu_1 and M_3 stalked for at least one-half length, sometimes fused.

Male genitalia with vinculum V-shaped, pointed anteriorly. Aedeagus club-shaped vesica bearing numerous small cornuti which diminish in size anteriorly.

Female genitalia with ductus bursae rather short. Ductus seminalis thickened basally.

Type.—In the U.S. National Museum.

Type data.—One female, Fort Myers, Fla., Apr. 16–23, Barnes collection; USNM 69383; genitalia slide No. 573, J. Shaffer, Nov. 23, 1965.

Specimens examined.—63 ♂, 3 ♀.

Distribution (Map 2).—Atlantic and Gulf Coastal Plain, recorded from Mississippi to New Jersey.

UNITED STATES: Florida: Alachua Co., Gainesville, 1 ♀, June 2, 1927 (J. Speed Rogers) [CU]; 1 ♂, June 29, 1927; 1 ♂, July 7, 1927; 8 ♂, July 8, 1927; 1 ♂, 1 ♀, July 10, 1927; 1 ♂ [CNC]; 5 ♂, July 1927 (J. Speed Rogers) [CU] 1 ♂, Apr. 20, 1952 (O. Peck) [CNC]; 1 ♂, Apr. 22, 1952; Dade Co., South Campus, Richmond, 2 ♂, Nov. 27, 1951 (F. G. Butcher) [CNC]; Indian River Co., Vero Beach, 1 ♂, no date (J. R. Malloch) [USNM]; Orange Co., Orlando, 1 ♂, June 14–18, 1927 (C. C. McBride) [CU]; Pasco Co., Elfers, 1 ♀, Apr. 17, 1952 (G. S. Walley) [CNC]; 6 ♂, Apr. 18, 1952 (J. R. Vockeroth) [CNC]; Polk Co., Lake Alfred, 1 ♂, June 30, 1928 (L. J. Bottimer) [USNM]; Sarasota Co., 1 ♂, May 5, 1946, (C. P. Kimball) [CPK]; Siesta Key, 1 ♂, Feb. 23, 1951 (C. P. Kimball) [CNC]; 1 ♂, Feb. 27, 1951; 1 ♂, Dec. 24, 1941; 2 ♂, Feb. 13, 1952; 1 ♂, Feb. 23, 1952; 3 ♂, Mar. 1, 1952; 1 ♂, Mar. 26, 1952; 2 ♂, Apr. 2, 1952; 1 ♂, Nov. 6, 1952; 1 ♂, Nov. 15, 1952; 1 ♂, Apr. 11, 1953; 1 ♂, Apr. 24, 1953; 1 ♂, Feb. 13, 1954; 1 ♂, Mar. 14, 1954; 1 ♂, Feb. 9, 1955; 1 ♂, Feb. 18, 1955; 1 ♂, Apr. 29, 1956; 1 ♂, Oct. 24, 1956; 1 ♀, Jan. 23, 1957; Seminole Co., Altamont, 1 ♂, Sept. 21, 1924 (F. R. Cole) [USNM].

Mississippi: Forrest Co., Camp Shelby, 1 ♂, Sept. 1–15, 1944 (C. D. Michener) [AMNH].

New Jersey: Ocean Co., Lakehurst, 1 ♂, July 24, 1939 (E. P. Darlington) [ANS].

North Carolina: Robeson Co., Maxton, 1 ♂, May 11, 1944 (A. B. Klots) [AMNH]; 2 ♂, May 23, 1944; 1 ♂, Oct. 4, 1944.

Discussion.—The species has been poorly collected outside of Florida, as is generally true for Coastal Plain groups, and is probably more common there than the few scattered records indicate. It may be sympatric with *californiella* in the Coastal Plain section of Texas.

Bandera Ragonot

Figure 68

Bandera Ragonot, 1887, p. 19. — Hulst, 1890, p. 202 [listed in Phycitinae].— Smith, 1891, p. 84 [listed in Phycitinae].—Ragonot, 1889, p. 117; 1901, p. 409. — Hulst, 1902, p. 440. — Barnes and McDunnough, 1917, p. 150. — Hampson 1918, p. 89. — McDunnough, 1939, p. 36. — Heinrich, 1956, pp. 1, 315, 316. [Type: *Anerastia binotella* Zeller, 1872. Original designation.]

Nasutes Hampson, 1930, p. 53 [described in Phycitinae]. — McDunnough, 1939, p. 28. — Heinrich, 1956, pp. 315–316 [listed as synonym of *Bandera*]. [Type: *Nasutes venata* Hampson, 1930, Monobasic.]

Diagnosis.—The absence of ocelli and the presence of a tongue, reduced but exposed between the palpi, serve to distinguish this genus from the other North American Phycitinae.

DESCRIPTION.—Frons conical; labial palpi porrect, outer sides of second and third segments clothed with white-tipped brown scales, basal segments clothed with broad white scales; maxillary palpi cylindrical, almost reaching frons; tongue exposed between palpi; antennae filiform, compressed, ciliate ventrally; ocelli absent; legs brown to fuscous laterally, tarsi brown and speckled with white.

Forewings with a brown-speckled white band anterior to cell; veins traced with white and margined on both sides with a sprinkling of brown scales; 9 veins; R_1 from well before outer angle of cell; R_2 from cell; R_{4+5} fused; M_1 from upper outer angle; M_{2+3} fused and from the angle; Cu_1 from before the angle; Cu_2 from well before the lower outer angle of cell. Hindwing light brown above and below, slightly darker toward apex; 7 veins; Sc and Rs long stalked; Cu_1 stalked with fused M_{2+3}; Cu_2 from well before the lower outer angle of cell.

Male genitalia with uncus broadly triangulate, slightly tapering, with apex broadly rounded, laterally and dorsocaudally setose. Gnathos arms terminating in an anterior ventral hook; apical process a simple posteriorly directed hook. Juxta U-shaped, with small lateral knobs. Vinculum stout. Valvae distally rounded; costa tubular, slightly tapering distally. Vesica unarmed.

Female genitalia with ovipositor tapering distally, about as long as basal width. Apophyses slender, well sclerotized; posterior about five or six times as long as their basal separation; anterior about two to four times as long as their basal separation. Ductus bursae long, weakly sclerotized. Bursa small; with a group of three or four small barlike signa near posterior end. Ductus seminalis threadlike; from near or at posterior end of bursa near signa.

DISCUSSION.—The genus shows affinities to a number of other phycitine genera and is probably closest to *Anagasta* Heinrich. The great preponderance of males in collections suggests that females are far less readily attracted to light.

Key to the Species of Bandera Based Upon the Maculation

1. Space between vein A_2 and cell of forewing a pale yellow field sprinkled with brown or with brown scales on fold of A_1 . . . . . **virginella**
   Space between vein A_2 and cell of forewing a solid yellow field, not sprinkled with brown 2
2. Basal area of costa yellow . . . . . **cupidinella**
   Entire length of costa white, sprinkled with brown scales . . . . **binotelia**

Bandera binotella (Zeller)

FIGURES 31, 68, 99, 136, 171

Anerastia binotella Zeller, 1872, pp. 554–555.
Bandera subluteella Ragonot, 1887, p. 19; 1889, p. 117. — Smith, 1891, p. 84 [listed in Phycitinae]. — Ragonot, 1901, pp. 410–411. — Hulst, 1902, p.

440. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 90. — McDunnough, 1939, p. 36. [New synonymy.]

Bandera binotella (Zeller). — Ragonot, 1889, p. 117. — Hulst, 1890, p. 202. — Smith, 1891, p. 84. — Ragonot, 1901, pp. 409–410. — Hulst, 1902, p. 440. — Dyar, 1908c, p. 116. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, pp. 89–90. — McDunnough, 1939, p. 36.

Diagnosis.—The presence of a transverse posterior line of dots and a transverse anterior dot on vein A_2 of the forewing, a truncate vinculum, and an incomplete transtilla each by itself distinguish this species from other members of the genus.

Description.—Frons about as long as diameter of eye, light brown; vertex, occiput, tegula, and prothorax white to light brown dorsally, gray brown laterally; abdomen light creamy brown dorsally, brown ventrally.

Forewing yellow between veins; discal cell, area between cell and vein A_2, and area posterior to A_2 solid yellow; transverse posterior variously developed as a row of dots on veins, best represented by a dark spot near end of vein A_2; a dark spot on vein A_2 halfway between tp line and wing base; light brown to brown on underside.

Male genitalia with transtilla incomplete. Lateral knobs of juxta well developed, setose. Vinculum rectangular, broadly truncate anteriorly. Aedeagus tapering posteriorly, subtruncate anteriorly. Eighth abdominal segment of male bearing lateral hair tufts.

Female genitalia with ovipositor sparsely setose. Ductus bursae broad.

Types.—*A. binotella*, in the British Museum (Natural History), (from Zeller collection); *B. subluteella*, in the Muséum National d'Histoire Naturelle.

Type data.—*A. binotella*, in the original description Zeller reports "Vaterland: Texas. Belfrage fing das Exemplar am 12. Juli." Type examined by Mr. Paul Whalley.

B. subluteella, lectotype male, hereby designated, labeled as follows: "TYPE; WALSM; 1901 coll. E. L. Ragonot Museum Paris; Bandera subluteella Rag. type orig. pl. XL f. 21; ♂ genitalia slide July–28–1965 J. Shaffer No. 553." The specimen also bears a small handwritten label inscribed with "Co19," probably intended to be "Colo" (Colorado). Ragonot may have interpreted the inscription as an abbreviation for California since that state is given as the type locality. I have seen no specimens of *binotella* from California although the species is found in Washington and therefore might be expected to occur in northern California.

Specimens examined.—71 ♂, 8 ♀.

Distribution (Map 4).—Washington southeastward to Arizona and Texas; eastern population on Atlantic Coastal Plain, New Jersey to Massachusetts.

UNITED STATES: Arizona: Apache Co., Greer, White Mts. (8500 ft.), 1 ♂, Aug. 6, 1962 (E. and I. Munroe) [CNC].

Colorado: Rocky Mountain National Park, 9 ♂, Aug. 15, 1937 (A. B. Klots) [AMNH].

Connecticut: New Haven Co., East River, 1 ♂, July 10, 1909 (Charles R. Ely) [USNM]; 1 ♂, July 30, 1910; 1 ♂, Aug. 13, 1910; 1 ♂, Aug. 29, 1910; 1 ♂, August 1910; 1 ♀, July 1911; Windham Co., Putnam, 1 ♂, Aug. 9, 1940 (A. B. Klots) [AMNH]; 1 ♀, August 1942; 1 ♂, Aug. 16, 1960 [ABK].

Massachusetts: Barnstable Co., Barnstable, 1 ♀, July 4, 1949 (C. P. Kimball) [CU]; same locality, 1 ♂, Sept. 11, 1949 (C. P. Kimball) [CPK]; 2 ♂, Aug. 5, 1950; 1 ♂, Sept. 12, 1952; Dukes Co., Martha's Vineyard, 1 ♀, July 20 (F. M. Jones) [CPK]; Worcester Co., Worcester, 1 ♂, July 11, 1933 [CU].

Montana: Roosevelt Co., Poplar, 1 ♂, July 15, 1921 (H. G. Dyar) [USNM].

New Jersey: Bergen Co., Oakland, 1 ♀, July 26, 1947 (C. P. Kimball) [CNC]; 3 ♂, Aug. 4, 1948; 3 ♂, Aug. 6, 1948; 1 ♀, Aug. 8, 1948 [CU]; 1 ♂, Aug. 8, 1948 [CNC]; 3 ♂, Aug. 9, 1948 [CNC, CPK]; 2 ♂, Aug. 10, 1948 [CPK]; 3 ♂, Aug. 13, 1948 [CNC, CPK]; 2 ♂, Aug. 14, 1948 [CPK]; 1 ♂, Aug. 22, 1948 [CPK]; 1 ♂, 1 ♀, Aug. 24, 1948 [CNC]; 1 ♂, August 1948; "5M Beach," 1 ♂, "7.2" (F. Haimbach) [USNM].

New Mexico: Colfax Co., Cimarron Canyon, Sangre de Cristo Mts. (7900 ft.), 1 ♂, July 7, 1962 (E. and I. Munroe) [CNC]; 1 ♂, July 13, 1962; Lincoln Co., Cedar Creek Camp, 2 mi. north of Ruidoso (7000 ft.), 1 ♂, June 30, 1961 (F., P., and J. Rindge) [AMNH]; 6 ♂, July 29, 1962 (E. and I. Munroe) [CNC]; McKinley Co., McGaffey, Zuni Mts. (7500 ft.), 2 ♂, July 20, 1962 (E. and I. Munroe) [CNC]; 4 ♂, July 21, 1962; 2 ♂, July 22, 1962; 2 ♂, July 24, 1962; Sandoyal Co., Frijoles Canyon, Bandelier Nat. Mon. (6000 ft.), 1 ♂, July 17, 1962 (E. and I. Munroe) [CNC].

Texas: Hildalgo Co., Mercedes, 1 ♂, Aug. 31, 1958 (H. Smalzried) [AMNH].

Washington: Chelan Co., Leavenworth, 2 ♂, July 3, 1949 (E. C. Johnston) [CNC]; Whitman Co., Pullman, 1 ♂, Aug. 6, 1898 (C. V. Piper) [USNM], from the paratype series of *Bandera virginella*, No. 11851 [USNM], genitalia slide, Carl Heinrich No. 6, Dec. 20, 1932.

CANADA: British Columbia: Oliver, 1 ♀, Aug. 2, 1953 (D. F. Hardwick) [CNC]; 1 ♂, Aug. 10, 1953; 1 ♂, Aug. 11, 1953; 1 ♂, Sept. 14, 1953.

Alberta: Dominion Range Sta., Manyberries, 1 ♂, Aug. 14, 1951 (D. F. Hardwick) [CNC].

Discussion.—The presumed habitat differences and the wide geographic separation between eastern and western populations indicate that they may well represent distinct biological species, but the absence of clear-cut morphological differences between them dictates that better criteria must be found if a new species name is to be given to the eastern population. Eastern specimens differ in having the frons, vertex, occiput, tegula, and prothorax covered with brown scales. The forewing ground color is reddish brown rather than yellow, and the transverse posterior line of dots is usually better developed.

Bandera cupidinella Hulst

Figures 32, 137, 172

Bandera cupidinella Hulst, 1888, p. 118. — Ragonot, 1889, p. 117. — Hulst, 1890, p. 203. — Smith, 1891, p. 84. — Ragonot, 1901, p. 410. — Hulst, 1902

p. 440. — Dyar, 1908c, p. 116. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 90. — McDunnough, 1939, p. 36. — Rindge, 1955, p. 160. — Heinrich, 1956, pp. 315–316.

Anerastia conspersella Ragonot, 1901, p. 404. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36.

Rhinaphe conspersella (Ragonot). — Hampson, 1918, p. 86.

Nasutes venata Hampson, 1930, p. 54. — McDunnough, 1939, p. 28 [listed in Phycitinae]. — Heinrich, 1956, pp. 315–316 [listed as a synonym of *cupidinella*].

Diagnosis.—This species may be recognized either by the absence of hair brushes in the male, or by the presence of a basal yellow margin on the costa of forewing of both sexes.

Description.—Frons about as long as diameter of eye, light brown; lateral scales of labial palpi with brown restricted to a subterminal band; vertex, occiput, and thorax light yellow brown dorsally, occiput and prothorax gray brown laterally; abdomen varying light brown to brown.

Forewing with costa abruptly yellow marginally at base to one-fifth distance to apex; yellow to orange yellow between veins; discal cell, area between cell and vein A_2, and area posterior to vein A_2 solid yellow with no brown scales; fringe on outer margin of alternating white and brown bands; brown beneath.

Male genitalia with transtilla complete, weakly sclerotized medially. Lateral knobs of juxta poorly developed. Vinculum bluntly rounded anteriorly. Aedeagus tapering very slightly posteriorly, bluntly rounded anteriorly. Eighth abdominal segment without lateral hair tufts.

Female genitalia with ovipositor setose. Ductus bursae broad.

Types.—*B. cupidinella*, in the U.S. National Museum; *N. venata* and *A. conspersella*, in the British Museum (Natural History).

Type data.—*B. cupidinella*, lectotype male, hereby designated, Colorado, Denver (Fernald collection), USNM 40074, genitalia slide No. 575, J. Shaffer, Nov. 23, 1964.

N. venata, in the original description Hampson reports: Colorado, Boulder, 1 ♂; Cockerell; alar expanse 20 mm. Type examined by Mr. Paul Whalley.

A. conspersella, lectotype male, hereby designated, Colorado, Akron, "11/9/83"; genitalia slide No. 705, J. Shaffer, Jan. 4, 1967.

Specimens examined.—36 ♂, 2 ♀.

Distribution (Map 4).

UNITED STATES: Colorado: Boulder Co., Boulder, 2 ♂, September 5 (Cockerell) [USNM]; Denver Co., Denver, 2 ♂, Sept. 1, 1904; 1 ♂, Sept. 3, 1904; 9 ♂, no date; Denver, 4 ♂, no date [USNM]; Prowers Co., Lamar, 4 ♂, 1 ♀, Sept. 24, 1945 (E. C. Johnston) [CNC]; Pueblo Co., Pueblo, 1 ♂, September 1899 [AMNH]; no locality, 11 ♂ [USNM].

New Mexico: Hot Springs (7000 ft.), 1 ♂, September [USNM]; no locality (7000 ft.), 1 ♀, 1927 (H. S. Parish) [CU].

Texas: Jeff Davis Co., Ft. Davis (5000 ft.), 1 ♂, 1927 (H. S. Parish) [CU].

Discussion.—Two males in the American Museum of Natural History are labeled "Type" from Hot Springs, N. Mex., 7000 ft., August, September. A male genitalia slide of the August specimen was prepared by Carl Heinrich, No. 3226, June 14, 1946. The type locality is given as Colorado and these specimens must be regarded as another example of Hulst pseudotypes. The specimen in the U.S. National Museum labeled "Type" is from Colorado and is assumed to be genuine.

Bandera virginella Dyar

Figures 33, 138, 173

Bandera virginella Dyar, 1908c, pp. 116–117. — Barnes and McDunnough, 1917, p. 150. — McDunnough, 1939, p. 36.

Diagnosis.—In the other members of this genus the discal cell and the area between the cell and vein A_2 are scaled with solid yellow, but in *virginella* these areas are pale yellow sprinkled with brown scales. The male genitalia are identical with those of *cupidinella*, but the eighth abdominal segment bears lateral hair tufts.

Description.—Frons about two-thirds as long as diameter of eye, dirty white dorsally and light brown ventrally; tongue somewhat less well developed than on other members of the genus; vertex, occiput, and thorax light yellow brown dorsally, occiput and prothorax gray brown laterally; abdomen varying light brown to brown.

Forewings with areas between veins pale yellowish white, variously sprinkled with brown scales; fold of A_1 traced with brown scales; brown beneath.

Male genitalia as in *B. cupidinella*. Eighth abdominal segment with hair tufts similar to those of *B. binotella*, but with fewer scales and therefore smaller.

Female genitalia with ovipositor sparsely setose. Ductus bursae slender.

Type.—In the U.S. National Museum.

Type data.—Holotype: Washington, Pullman, male, July 24, 1898; C. V. Piper; Washington Exp. Sta. No. 463; USNM 11851; male genitalia slide No. 5, Carl Heinrich, Dec. 20, 1932.

Paratypes: Five specimens, Washington, Pullman, males; C. V. Piper; USNM 11851. Dates are July 8, 1898, Aug. 6, 1898, Aug. 10, 1898, July 31, 1899, Aug. 3, 1899. The specimen collected Aug. 6, 1898 bears genitalia slide label C.H. No. 6, Dec. 20, 1932 and belongs to *B. binotella*.

Other specimens examined.—51 ♂, 7 ♀.

Distribution (Map 4).—New Mexico to California, north to Alberta and British Columbia.

UNITED STATES: Arizona: Cochise Co., Southwestern Res. Sta., Chiricahua Mts., 1 ♂, Apr. 11, 1962 (Carl W. Kirkwood) [CNC]; 1 ♂, Apr. 18, 1962; Yavapai Co., Prescott, 5 ♂, May 6, 1950 (E. C. Johnston) [CNC].

California: Riverside Co., Kenworthy, 6 ♂, June 9, 1937 (E. C. Johnston) [CNC]; Lake Hemet, 1 ♂, June 9, 1937 (E. C. Johnston) [CNC]; San Bernardino Co., 12 mi. southeast of Ivanpan, 1 ♂, May 1, 1956 (J. Powell) [UCB]; Upper Santa Ana River, 1 ♂, Aug. 12, 1948 (Grace H. and John L. Sperry) [AMNH]; Siskiyou Co., Indian Butte, 4 ♂, July 16, 1936 (E. C. Johnston) [CNC]; Ventura Co., Camp Ozena, Upper Cuyama, 4 ♂, June 13, 1963 (C. W. Kirkwood) [CPK]; 3 ♂, June 14, 1963; 1 ♂, June 18, 1963, 1 ♂, June 19, 1963; 2 ♂, June 24, 1963; 1 ♂, June 27, 1963.

Colorado: Rock Creek Canyon, 1 ♂, Sept. 26, 1957 (Margot May) [CNC]; 1 ♂, Sept.28, 1957.

New Mexico: Eddy Co., White City, 1 ♂, May 15, 1950 (E. C. Johnston) [CNC].

Washington: Walla Walla Co., Walla Walla, 1 ♀, Apr. 9, 1931 (D. R. Brannon) [USNM]; 1 ♂, Apr. 21, 1931; 3 ♂, Apr. 18, 1935 (H. P. Lanchaster); Whitman Co., Pullman, 1 ♂, June 19, 1930 (J. F. Clarke) [USNM]; 1 ♂, 1 ♀, Aug. 3, 1932; 2 ♂, July 3, 1935; Yakima Co., Satus Creek, 2 ♂, Aug. 19, 1949 (E. C. Johnston) [CNC]; 1 ♂, Sept. 16, 1949; Tieton, 1 ♂, May 12, 1931 (Fred Deari) [USNM].

CANADA: Alberta: Medicine Hat, 1 ♂, June 24, 1945 (K. Bowman) [CNC].

British Columbia: Shingle Cr. Road, Keremeos, 1 ♂, June 8, 1935 (A. N. Gartrell) [CNC]; 3 ♀, July 15, 1935; 2 ♀, July 22, 1935; Oliver (1000 ft.), 1 ♂, Aug. 10, 1953 (D. F. Hardwick) [CNC]; 1 ♂, Aug. 11, 1953.

No data given except S. Diego, 1 ♂, July 19, 1924 [USNM].

Wakulla, new genus

Type.—*Bandera carneella* Barnes and McDunnough, 1913.

Diagnosis.—Among the phycitine genera exhibiting a reduced tongue this is the only genus in which the males have both hair tufts on the eighth abdominal segment and a spatulate uncus.

Description.—Frons conical, about two-thirds as long as eye diameter; labial palpi slightly ascending and extending somewhat beyond frons in male, female ascending, reaching beyond vertex; maxillary palpi well developed, cylindrical; tongue reduced, visible between bases of palpi, scaled at base; antennae filiform in both sexes, compressed, ciliate ventrally, cilia short, about one-sixth as long as segment width; ocelli minute.

Forewing and hindwing venation as in *Bandera*.

Male genitalia with uncus spatulate, setose dorsally and laterally. Gnathos arms each terminating in anterior hook; apical process bifurcate. Transtilla incomplete. Juxta U-shaped, surrounding aedeagus ventrally and laterally. Vinculum stout, tapering, broadly truncate anteriorly, length and width about equal. Valvae with costa tubular,

terminating in short free spine just before apex of cucullus; sacculus inflated on basal one-fourth of valve. Aedeagus stout, slightly tapering distally, vesica unarmed. Eighth abdominal segment of male with hair tufts.

Female genitalia with ovipositor tapering distally, sparsely setose, about 1½ times as long as broad. Apophyses well sclerotized, posterior about four to five times as long as basal separation, anterior slightly less than twice as long as basal separation. Ductus bursae long. Bursa small, bearing three small barlike signae. Ductus seminalis leaving bursa near posterior end, just posterior to signae, threadlike, well sclerotized.

Wakulla carneella (Barnes and McDunnough), new combination

FIGURES 43, 100, 139, 174

Bandera carneella Barnes and McDunnough, 1913, p. 184; 1917, p. 150. — Grossbeck, 1917, p. 134. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

DIAGNOSIS.—This is the only known species in the genus.

DESCRIPTION.—Labial palpi with basal segments white, second and third segments light brown or reddish brown on outer sides, white or nearly so on inner sides; maxillary palpi reddish brown; antennae with scape brown, shaft light brown; frons, vertex, occiput, patagia, and tegulae reddish brown.

Forewing reddish brown, sprinkled with dark brown scales; two small dark brown spots at distal end of cell; male with tuft of black scales at base of costa. Hindwing light brown.

Genitalia as described for the genus.

TYPE.—In the U.S. National Museum.

TYPE DATA.—Holotype male, Everglades Fla., Apr. 8–15, Barnes collection, "Photograph pl. 1 No. 5"; USNM 69384; genitalia slide No. 574, J. Shaffer, Nov. 23, 1965.

SPECIMENS EXAMINED.—3 ♂, 1 ♀.

DISTRIBUTION (Map 3).—Known only from Florida.

UNITED STATES: FLORIDA; Manatee Co., Gulf Coast Exp. Sta., Bradenton, 1 ♂, Aug. 5, 1955 (E. G. Kelsheimer) [CPK]; 1 ♂, Mar. 28, 1956; Sarasota Co., Siesta Key, 1 ♂, Feb. 13, 1951 (C. P. Kimball) [CPK]; 1 ♀, Nov. 9, 1952.

Tampa Ragonot

Tampa Ragonot, 1887, pp. 19–20; 1889, p. 117. — Hulst, 1890, p. 203 [listed in Phycitinae]. — Smith, 1891, p. 84 [listed in Phycitinae]. — Ragonot, 1901, p. 411. — Hulst, 1902, p. 440. — Barnes and McDunnough, 1917, p. 150. — Forbes, 1923, p. 637. — Hampson, 1918, p. 62. — McDunnough, 1939, p. 36. [Type: *Tampa dimediatella*, 1887. Monobasic.]

Diagnosis.—The presence of only two radial veins in the forewing distinguishes *Tampa* among the phycitine genera showing a reduced tongue.

Description.—Frons conical; labial palpi ascending, often porrect in females, about three times eye diameter in males, 3½ times in females; maxillary palpi three-segmented, cylindrical, reaching frons or nearly so; tongue reduced, usually visible between palpi; antennae filiform in both sexes, somewhat thicker in male, female scaled dorsally and laterally, ventrally with short appressed cilia, male scaled dorsally, ventrally with cilia about one-half segment width, hooked at tips; ocelli absent.

Forewing with 8 veins; R_1 from near upper outer angle of cell, R_{2+4} fused, from the angle; M_1 from about one-third from top of cell; M_{2+3} fused, from lower outer angle; Cu_1 from just before the angle; Cu_2 from well before the angle. Hindwing with 7 veins; Sc and Rs long stalked: M_1 from upper outer angle; M_{2+3} fused, long stalked with Cu_1, from lower outer angle; Cu_2 from just before the angle.

Male genitalia with uncus tapering, broadly and bluntly rounded apically; rather densely setose dorsally and laterally. Gnathos with medial process small, simple, shallowly notched apically. Transtilla complete, weakly sclerotized. Juxta crescent shaped, with pair of lateral setose tubercles. Vinculum V-shaped, apex bluntly rounded. Valve narrow, sides nearly parallel, apex rounded. Vesica unarmed.

Female genitalia with ovipositor tapering distally, about twice as long as wide. Apophyses slender, posterior about six or seven times as long as their basal separation; anterior about 2½ times as long as their basal separation, diverging. Ductus bursae long, slender. Bursa small, with a group of five to seven parallel barlike signae extending anteriorly from ductus seminalis near posterior end. Ductus seminalis from posterior end of bursa, tapering, then slender.

Tampa dimediatella Ragonot

Figures 35, 69, 101, 140, 175

Tampa dimediatella Ragonot, 1887, p. 20; 1889, p. 117. — Hulst, 1890, p. 203. — Smith, 1891, p. 84. — Ragonot, 1901, p. 411. — Hulst, 1902, p. 440. — Barnes and McDunnough, 1917, p. 150. — Grossbeck, 1917, p. 134. — Hampson, 1918, p. 63. — Forbes, 1923, p. 367. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 251.

Diagnosis.—This is the only known species in the genus.

Description.—Labial palpi with basal segments and ventral and inner sides of second segments white, third segments and outer sides of second dark brown to black; maxillary palpi, frons, vertex, sides of occiput dark brown to black; dorsum of occiput, patagia, and

tegulae somewhat lighter; antennae brown; legs white on inner sides, outer sides varying light brown to dark brown.

Forewings light brown anterior to cell, sprinkled with dark brown scales; cell a white band extending to wing apex, sprinkled with a few dark brown scales; discal spot small, black; cubitus traced with black sometimes extending from cell to A_1 fold; wings grayish-red posterior to black trace; A_2 traced with black. Underside brown to grayish brown, cell lighter. Hindwings light brown above and below, darker apically.

Genitalia as described for the genus.

TYPE.—In the Muséum National d'Histoire Naturelle.

TYPE DATA.—Lectotype male, hereby disignated, Archer, Florida, "23/3 82": collection C. V. Riley; male genitalia slide No. 550, J. Shaffer, July 28, 1965.

SPECIMENS EXAMINED.—180 ♂, 39 ♀.

DISTRIBUTION (Map 1).—Atlantic and Gulf Coastal Plain, eastern Texas to Florida, northward into Virginia.

UNITED STATES: FLORIDA: Alachua Co., Archer, 1 ♂, "23/3 82" [USNM]; Gainesville, 7 ♂, 2 ♀, July 8, 1927 (J. Speed Rogers) [CU]; 1 ♀, July 10, 1927; Charlotte Co., Punta Gorda, 1 ♀, Apr. 11, 1952 (J. R. Vockeroth) [CNC]; 1 ♂, 1 ♀, Apr. 12, 1952 (G. S. Walley); Dade Co., Princeton, 2 ♂, 1 ♀, Apr. 4, 1952 (J. R. Vockeroth) [CNC]; South Campus, Richmond, 1 ♂, Nov. 27, 1951 (F. G. Butcher) [CNC]; Highlands Co., Lake Placid, Archbold Biol. Sta., 1 ♀, Apr. 2, 1945 (J. G. Needham) [CNC]; Archbold Biol. Sta., 3 ♂, June 17, 1964 (Jay C. Shaffer) [JCS]; 8 ♂, 2 ♀, June 18, 1964; 2 ♂, June 20, 1964; 3 ♂, June 22 1964; 1 ♂, June 23, 1964; 1 ♂, 1 ♀, June 25, 1964; 2 ♂, June 26, 1964; 1 ♀ June 27, 1964; 3 ♂, 5 ♀, June 28, 1964; 5 ♂, 2 ♀, June 29, 1964; 3 ♂, July 1 1964; 2 ♂, July 2, 1964; 12 ♂, 2 ♀, July 3, 1964; 4 ♂, July 4, 1964; 20 ♂, 7 ♀, July 5, 1964; 5 ♂, July 6, 1964; 1 ♂ 1 ♀, July 7, 1964; 1 ♂, July 11, 1964; 36 ♂, 3 ♀, July 12, 1964; 6 ♂, July 13, 1964; 1 ♂, Dec. 21, 1964 (S. W. Frost)[CPK]; Manatee Co., Oneco, 1 ♂, April 1954 (Paula Dillman) [CPK]; Monroe Co., Key Largo, 2 ♂, Nov. 6, 1964 (Mrs. Spencer Kemp) [CPK]; 2 ♂, Nov. 16, 1964; Pasco Co., Elfers, 1 ♂, Apr. 10, 1952 (J. R. Vockeroth) [CNC]; Pinellas Co., St. Petersburg, 1 ♂, September [USNM]: Sarasota Co., Siesta Key, 1 ♂, Apr. 16, 1953 (Charles P. Kimball) [CPK]; 1 ♂, Mar. 28, 1954; 1 ♂, Apr. 1, 1954; 1 ♂, Apr. 27, 1956; 4 ♂, Oct. 24, 1956; 1 ♂, Jan. 28, 1957; 2 ♀, May 21, 1957; St. Johns Co., Hastings, 1 ♂, Aug. 1, 1900 [USNM].

GEORGIA: Bryan Co., Clyde, 1 ♂, Sept. 11–12, 1931 (Bradley and Knorr) [CU].

LOUISIANA: Natchitoches Parish, 2 ♂, August (G. Coverdale) [USNM]; Vernon Parish, 1 ♂, 1 ♀, July (G. Coverdale) [USNM].

TEXAS: Collin Co., Plano, 1 ♀, August (E. S. Tucker) [USNM]; Fort Bend Co., Richmond, Brazos River, 19 ♂, 4 ♀, June 22, 1917 [CU]; 1 ♂ [CNC]; Wharton Co., Wharton, 6 ♂, 1 ♀, June 24, 1917 [CU]; Victoria Co., Victoria, 1 ♂, June 24, 1917 [CU]; Victoria, 1 ♂, no date [USNM].

VIRGINIA: Dinwiddie Co., Dinwiddie, 1 ♂, June 1, 1917 [CU].

Barberia Dyar

Barberia Dyar, 1905, p. 39.—Barnes and McDunnough, 1917, p. 149—Hampson, 1918, p. 131.—McDunnough, 1939, p. 36. [Type: *Barberia affinitella* Dyar, 1905. Monobasic.]

Diagnosis.—The distinctive uncus, basally triangular and with a narrow terminal portion, distinguishes the genus from all other New World phycitines with similar wing venation.

Description.—Frons oblique; labial palpi upturned, slender; maxillary palpi well developed, reaching frons; tongue exposed between palpi; antennae filiform, compressed; ocelli small, appearing as darkened spots.

Forewings with 9 veins; R_2 from near upper outer angle of cell; R_{3+4} fused, separate from R_2 at base; M_1 from angle; M_{2+3} fused, from lower outer angle; Cu_1 from just before angle; Cu_2 from before angle. Hindwing with 7 veins; Sc and Rs long stalked; M_1 from upper outer angle of cell; M_{2+3} fused, short stalked with Cu_1, from lower outer angle; Cu_2 from before the angle.

Male genitalia with uncus triangular on basal two-thirds, distal third narrow, distal half heavily setose dorsally and laterally. Gnathos arms terminating in anterior ventral hook; medial process a flattened posteriorly directed hook, curved dorsally at tip. Transtilla incomplete, a pair of flat plates about 3½ times as long as wide. Juxta U-shaped, arms sharp pointed. Vinculum truncate. Valvae with apex obliquely rounded. Aedeagus straight, vesica unarmed.

Female genitalia with ovipositor tip broadly rounded. Apophyses straight, broadened basally; posterior parallel, anterior slightly longer, diverging. Ductus bursa narrow, leaving bursa about one-fifth from posterior end. Ductus seminalis from posterior end of bursa. Bursa well developed; signum a long narrow sclerotized infolding about one-fourth from anterior end of bursa.

Discussion.—The male genitalia are quite similar to Heinrich's illustration of *Anderida*, but males of *Barberia* differ in the truncate vinculum and lack of hair tufts on the eighth abdominal segment. The two genera are less similar with respect to female genitalia and wing venation.

Barberia affinitella Dyar

Figures 24, 102, 141, 176

Barberia affinitella Dyar, 1905, p. 39.—Barnes and McDunnough, 1917, p. 149.—Hampson, 1918, p. 131.—McDunnough, 1939, p. 36.

Diagnosis.—This is the only known species in the genus.

Description.—Labial palpi with basal segments and inner sides of second and third white, outer sides brown; maxillary palpi brown;

antennae brown scaled on all sides; frons, occiput, patagia, and tegulae brown, lighter dorsally.

Forewings with brown-sprinkled white band anterior to cell, reaching just short of apex, ground brownish orange, lighter posterior to cell. Hindwing light brown above and below, slightly darker toward apex.

Genitalia as described for the genus.

TYPES.—In the U.S. National Museum.

TYPE DATA.—Lectotype, hereby designated, male, Brownsville, Tex., Los Borregos, June 6, 1904, H. S. Barber; USNM 8196; genitalia slide No. 576, J. Shaffer, Nov. 23, 1965. Labeled in Dyar's handwriting: "*Barberia affinitella* Type Dyar."

Lectoparatypes: Brownsville, Tex., Los Borregos, male, two females, June 5, 1904; two males, June 6, 1904, H. S. Barber; USNM 8196.

The original description gives June 5, 1904 as the date for all six specimens.

OTHER SPECIMENS EXAMINED.—23 ♂, 4 ♀.

DISTRIBUTION (Map 3).

UNITED STATES: ARIZONA: Cochise Co., Paradise, 3 ♂, August, September, October (Poling) [CN]; Southwestern Res. Sta., 5 mi. west Portal, 1 ♂, Apr. 27, 1961 (M. A. Cazier) [AMNH]; Santa Cruz Co., Madera Canyon (4880 ft.), Santa Rita Mts., 1 ♂, Sept. 24, 1959 (R. W. Hodges) [JGF]; county unknown, 5 ♂, August (O. C. Poling) [USNM].

TEXAS: Cameron Co., Brownsville, Los Borregos, 4 ♂, 4 ♀, June 5, 1904 (H. S. Barber) [USNM]; 1 ♂, June 6, 1904; Brownsville, 4 ♂, June 1904 (H. S. Barber) [USNM]; 1 ♂, March 27–28 (F. H. Benjamin) [USNM]; San Benito, 1 ♂, March 24–30 [USNM]; 1 ♂, June 24–30; Jeff Davis Co., Fort Davis, 1 ♂, May 20, 1950 (E. C. Johnston) [CNC].

Ragonotia Grote

Ciris Ragonot, 1887, p. 17 [not Koch, 1848, p. 85 *in* Arachnida; not Grote, 1863, p. 65, *in* Agaristidae]. [Type: *Ciris discigerella* Ragonot, 1887. Original designation.]

Ragonotia Grote, 1888, p. 75. — Ragonot, 1889, p. 117. — Hulst, 1890, p. 204. — Smith, 1891, p. 84. — Ragonot, 1901, p. 329. — Hulst, 1902, p. 437. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, pp. 123–124. — McDunnough, 1939, p. 35. [Type: *Ciris discigerella* Ragonot, 1887.]

Psammia Hampson, 1930, p. 71. — McDunnough, 1939, p. 31. — Heinrich, 1956, p. 315. [New synonymy. Type: *Psammia flavipicta* Hampson, 1930. Monobasic.]

DIAGNOSIS.—Among the phycitine genera with reduced tongue and prominent transverse wing markings, the presence of vein M_2 in the hindwing distinguishes *Ragonotia* from *Laetilia* and *Martia*.

DESCRIPTION.—Frons rounded, smooth; labial palpi decurved, about 3½ to 4 times eye length; maxillary palpi greatly reduced, usually not easily discernible; tongue greatly reduced; antennae filiform, male with ventral side of segments convex, cilia about twice segment width,

forming two bands, female with cilia about half segment width; ocelli well developed.

Forewings with 11 veins; R_2 free from cell or short stalked with R_{3+4}; R_{3+4} stalked; M_1 from about one-third distance from top of cell; M_{2+3} short stalked, from lower outer angle of cell; Cu_1 from before the angle. Hindwing with 8 veins; Sc and Rs approximate for short distance beyond cell, then diverging; M_1 from upper outer angle; M_2 stalked with M_3 for about two-thirds length; Cu_1 stalked with M_{2+3} for about one-third length, from lower outer angle; Cu_2 from just before angle.

Male genitalia with uncus triangular, apex rounded, dorsal surface uniformly and rather densely covered with short cilia. Gnathos with medial process simple, tip hooked dorsally. Transtilla incomplete. Juxta bell-shaped. Vinculum rounded. Valvae rounded, densely pubescent on inner side; costa tubular; sacculus with clasper bearing scattered setae. Aedeagus with vesica bearing a single large sharp-pointed cornutus and a patch of numerous short, sharp spines.

Female genitalia with dorsal margin of ovipositor rather densely covered with long hairs. Apophyses rather straight, anterior slightly longer and stouter than posterior. Bursa small, very weakly sclerotized, unarmed.

Ragonotia dotalis (Hulst)

Figures 38, 62, 103, 142, 177

Anerastia dotalis Hulst, 1886, p. 164. — Rindge, 1955, p. 161.
Ciris discigerella Ragonot, 1887, p. 17.
Anoristia olivella Hulst, 1888, p. 117. — Rindge, 1955, p. 168.
Ragonotia saganella Hulst, 1890, p. 205. — Smith, 1891, p. 84. — Hulst, 1902, p. 437. — Rindge, 1955, p. 170. [New synonymy.]
Ragonotia dotalis (Hulst).—Ragonot, 1889, p. 117. — Hulst, 1890, p. 205.—Smith, 1891, p. 84.—Ragonot, 1901, p. 329.—Hulst, 1902, p. 437.—Barnes and McDunnough, 1917, p. 149.—Hampson, 1918, p. 124.—McDunnough, 1939, p. 35.
Megasis indianella Dyar, 1923, pp. 28–29 [described in Phycitinae].
Psammia flavipicta Hampson, 1930, pp. 71–72.—McDunnough, 1939, p. 31.—Heinrich, 1956, p. 315.—Kimball, 1965, p. 251. [New synonymy.]

Diagnosis.—This is the only known species in the genus.

Description.—Labial palpi white, outer sides of second and third segments variously sprinkled with subapically brown banded white scales; antennae white, brown band on center of each segment; frons white with scattered brown scales, vertex and dorsum of occiput white, often with scattered brown scales, occiput laterally of alternating black and white bands; legs white, sprinkled with brown on outer sides, proximal end of each tarsal segment black banded.

Forewings with ground white, finely sown with dark brown scales, variable in number, producing a light brown to gray color; basal spot

light orange, usually indistinctly bordered with black distally; transverse anterior light orange, partially bordered internally with black, externally with narrow white band, then black blending gradually into ground color; discal spot light orange, usually with white center, spot bordered above and below with black; transverse posterior light orange, bordered internally with narrow white band, then black, veins traced with black on tp band, tracing extending to the black terminal line.

Hindwings light brown, apical area and terminal line brown; fringe white, brown band near its base; base of cubitus fringed, A_2, A_3, and inner margin heavily fringed.

Genitalia as described for the genus.

Types.—*A. dotalis*, in the American Museum of Natural History (lectotype); *C. discigerella*, in the Museum National d'Histoire Naturelle; *A. olivella* and *R. saganella*, in the American Museum of Natural History; *M. indianella*, in the U.S. National Museum; *P. flavipicta*, in the British Museum (Natural History).

Type data.—*A. dotalis*, lectotype female, hereby designated, Phoenix, Ariz., June (abdomen intact); *discigerella*, lectotype female, hereby designated, Arizona, genitalia slide No. 555, J. Shaffer, Aug. 11, 1965; *olivella*, lectotype female, hereby designated, southern California, genitalia slide No. 587, J. Shaffer, Nov. 28, 1965, in the original description the type locality is given as Needles, Calif.; *saganella*, lectotype female, hereby designated, Colorado, May, genitalia slide No. 3217, Carl Heinrich, June 14, 1946, in the original description Hulst reports "From T.D.A. Cockerell, of West Cliff, Col., where the unique specimen was taken at light, May 24th."; *indianella*, one female, Indian Wells, Calif., May 8, 1921, USNM 25840, genitalia slide No. 1103, Carl Heinrich, Apr. 2, 1938; *flavipicta*, lectotype male, hereby designated, labeled as follows: "Type; Florida; 99–49.; 1945/206; Psammia flavipicta type ♂. Hmpsn.; ♂ genitalia slide I–4–1967 J. Shaffer No. 708." The validity of Florida as the type locality must be questioned as the species has not otherwise been recorded east of western Texas.

Specimens examined.—75 ♂, 38 ♀.

Distribution (Map 1).—Southwestern United States, southern California eastward into western Texas.

UNITED STATES: Arizona: Cochise Co., Paradise, 1 ♀ [USNM]; San Bernardino Ranch (3750 ft.), 2 ♂, August (F. H. Snow) [USNM]; 2 ♀, [UK]; Maricopa Co., Phoenix, 3 ♂, 4 ♀, March (Kunze) [USNM]; 1 ♂, April; 1 ♀, June; 1 ♀, September; 1 ♂, no date; 1 ♀, June [USNM]; 1 ♂, June [USNM]; labeled "Ragonotia dotalis *Type* Hulst," "Type No. 40073 U.S.N.M.," Male genitalia slide No. 1100, Carl Heinrich, Apr. 2, 1938; 1 ♀, April [AMNH]; 1 ♂, May [AMNH]; 1 ♀, June [AMNH]; 1 ♀, no date [AMNH]; Tempe, 1 ♂, Mar. 8, 1920 (E. V. Walter, H. L. Arnold) [USNM]; Pima Co., Santa Rita Mts., 1 ♀,

May 1–7 [USNM]; Yavapai Co., 1 ♂, no date [USNM]; Yuma Co., Indian Wash near Martinez Lake, 1 ♂, June 12, 1961 (C. A. Toschi) [UCB]; Palomas, 2 ♂, Aug. 8, 1917 [CU]; Wellton, 2 ♂, Aug. 9, 1917 [CU]; Yuma, 1 ♀, May [AMNH]; no county, southern Arizona, 1 ♂, no date [USNM]; 1 ♀, Sept. 8–15 [USNM].

California: Imperial Co., Dixieland, 1 ♂, Mar. 1–15, 1922 (O. C. Poling), [USNM]; 3 ♂, 2 ♀, spring 1922; Travertine Rock, 1 ♂, Apr. 10, 1954 (Stange, Menke, Cline, and Thomas) [LACM]; Riverside Co., Coxcomb Mts., 5 ♂, 1 ♀, Feb. 28, 1937 (Lloyd M. Martin) [LACM]; (J. A. Comstock); 1 ♂, 3 ♀, Mar. 1 1937 (Lloyd M. Martin); Dis Palmas Springs, 1 ♀, Mar. 17, 1940 (George Willett) [LACM]; Indian Wells, 1 ♂, 2 ♀, Mar. 8, 1940 (J. C. von Bloeker) [LACM]; Indio, 1 ♂, Mar. 23, 1955 (W. R. M. Mason) [CNC]; La Quinta, 1 ♂, Mar. 5, 1955 (J. E. H. Martin) [CNC]; Palm Desert, 1 ♂, Mar. 15, 1954 (A. H. & S. K. Rindge) [AMNH]; Thermal, 5 ♂, 1 ♀, Aug. 17–18, 1927 [CU]; 1 ♂, July 10, 1956 (M. Wasbauer) [UCB]; Thousand Palms, 1 ♂, Feb. 24, 1955 (D. F. Hardwick) [CNC]; Feb. 24, 1955 (W. R. Richards); (W. R. M. Mason) Feb. 28, 1955 (D. F. Hardwick); 1 ♀, Mar. 1, 1955 (W. R. M. Mason); 1♂, 1♀, Mar. 2, 1955 (D. F. Hardwick); 1 ♂, Mar. 5, 1955 (W. R. M. Mason); 4 ♂, Mar. 7, 1955; 2 ♂, 1 ♀, Mar. 8, 1955 (J. E. H. Martin); 1 ♂, Mar. 10, 1955 (W. R. M. Mason); 2 ♂, Mar. 11, 1955 (J. E. H. Martin); 1 ♂, Mar. 13, 1955; 2 ♂, Mar. 18, 1955; 1 ♂, Mar. 23, 1955 (W. R. M. Mason); 1 ♀, Mar. 24, 1955 (J. E. Martin); Mar. 28, 1955 (W. R. Richards); 1 ♂, Apr. 16, 1955 (W. R. M. Mason); San Bernardino Co., Baker, 1 ♂, July 30, 1954 (L. Martin & Rees) [LACM]; Yermo, Mojave Desert, 1 ♂, Apr. 10, 1936 (J. A. Comstock) [USNM]; near Yermo, 5 ♂, [LACM]; Yermo, 3 ♂, Mar. 18, 1940 (G. Beevor) [LACM]; San Diego Co., Borrego, 1 ♀, Mar. 22, 1940 (Grace H. & John L. Sperry) [CNC]; Borrego, 1 ♀, May 3, 1956 (J. Powell) [UCB]; Apr. 21, 1960 (J. F. Lawrence).

New Mexico: Dona Ana Co., Mesilla Park (3800 ft.), 2 ♂, July 8 (Cockerell) [USNM]; Mesilla, 1 ♂, no date (C. N. Ainslie) [USNM]; Mesquite near Mesilla Park, 1 ♂, July 12, 1917 [CU]; Hidalgo Co., Lordsburg, 2 ♀, May 9, 1950 (E. C. Johnston) [CNC]; Luna Co., 10 mi. east of Deming, 1 ♂, July 12, 1917 [CU].

Texas: Reeves Co., Pecos, 2 ♀, May 18, 1950 (E. C. Johnston) [CNC]; Brewster Co., Marathon, 2 ♂, May 23, 1950 (E. C. Johnston) [CNC].

Utah: No locality, 1 ♀, Henry Edwards collection, No. 14158 [AMNH].

Discussion.—There is uncertainty regarding the identity of the type specimens of *dotalis* and *saganella*. In the American Museum of Natural History is a series of two females and one male, all labeled Phoenix, Ariz., June, "*Anerastia dotalis* Type Hulst" (Hulst's handwriting); the male specimen also bears a slide preparation label, genitalia slide No. 3216, Carl Heinrich, June 14, 1946. One of the females has the tip of its abdomen broken off. A female specimen in the U.S. National Museum also bears Hulst's type label and the data Phoenix, Ariz., May. In his original description of *dotalis*, Hulst reported only that he had one female from Arizona. In the absence of any evidence indicating which specimen Hulst based his original description upon, I have chosen as the lectotype the more nearly intact of the two female specimens in the type series of the American Museum of Natural History. The other three "types" are thus presumed to be pseudotypes.

In describing *saganella*, Hulst indicated clearly that his new species was very different from *dotalis* and stated that the two were "hardly congeneric." Hulst's type of *saganella*, on the other hand, is obviously a specimen of *dotalis*, thus the validity of the type and the accuracy of the description are open to question.

Martia Ragonot

Martia Ragonot, 1887, p. 18; 1889, p. 117. — Hulst, 1890, p. 209. — Smith, 1891, p. 84. — Ragonot, 1901, p. 367. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 118. — McDunnough, 1939, p. 36. [Type: *Martia arizonella* Ragonot, 1887. Monobasic.]

Urula Hulst, 1900, p. 175; 1902, p. 437. [Type: *Urula incongruella* Hulst, 1900. Monobasic.]

Diagnosis.—The genus is easily recognized by the combination of protuberant frons and prominent transverse lines on the forewings.

Description.—Frons produced into obliquely truncate cone, its rim incised ventrally, produced and finely serrate laterally, deeply incised dorsally forming shallow trough rimmed with fine teeth; labial palpi porrect or somewhat decurved, about 3½ times eye length in male, and about four times in female; maxillary palpi cylindrical, almost reaching frons; tongue rudimentary; antennae subserrate in male, each segment with two ventral bands of cilia, cilia about 2½ times as long as segment width, filiform in female, cilia not in bands, shorter than segment width; ocelli small, conical.

Forewings with 11 veins; R_2 free from cell near R_{3+4}; R_{3+4} stalked, from upper outer angle of cell; M_1 arising about one-third from top of cell; M_{2+3} short stalked or from point at lower outer angle of cell; Cu_1 from just before the angle. Hindwing with 7 veins; Sc and Rs approximate for short distance beyond cell; M_1 from upper outer angle of cell; M_{2+3} fused, short stalked with Cu_1, from lower outer angle.

Male genitalia with uncus triangular, rounded apically, finely ciliate dorsally and laterally. Gnathos with medial process simple, extending caudad, tip sharp, curving dorsad. Transtilla a pair of weakly sclerotized irregular plates. Juxta scoop-shaped. Vinculum broader than long. Costa tubular on basal four-fifths, tapering. Aedeagus slender, vesica unarmed.

Female genitalia with ovipositor rather densely setose, tip broadly rounded. Posterior apophyses curved posteroventrally on posterior fourth; anterior straight, directed anteroventrally at angle of about 45° to posterior. Ductus bursae short. Bursa unarmed. Ductus seminalis leaving bursa about one-fourth distance from posterior end.

Martia arizonella Ragonot

FIGURES 37, 49, 63, 104, 143, 178

Martia arizonella Ragonot, 1887, p. 18; 1889, p. 117. — Hulst, 1890, p. 209. — Smith, 1891, p. 84. — Ragonot, 1901, p. 367. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, p. 118. — McDunnough, 1939, p. 36.

Urula incongruella Hulst, 1900, pp. 175–176; 1902, p. 437. — Rindge, 1955, p. 164.

DIAGNOSIS.—This is the only known species in the genus.

DESCRIPTION.—Frons close scaled, brown; labial palpi with basal segments light brown, second and third segments clothed with white-tipped brown scales on outer sides, lighter on inner sides; maxillary palpi of white to white-tipped brown scales; antennae white, each segment brown banded; vertex brown, lighter behind antennae; occiput, patagia, and tegulae varying white to brown; legs clothed with light brown to white-tipped brown scales on outer sides, distal end of each tibial segment white banded.

Forewings with transverse anterior, transverse posterior, discal spot, area between Cu_2 and A_2, and basal area posterior to A_2 golden yellow; transverse anterior interrupted in cell by dark brown area which gradually narrows and extends posteriorly to A_2 as a wedge between the ta line and the prominent narrow white line bordering it distally. Transverse anterior bordered inside by white anterior to cubitus, by brown band posterior to cell, band extending to costa at wing base; wing anterior to cell and between transverse lines white with sprinkling of brown scales; area surrounding discal spot brown, extending posteriorly to Cu_2, often enclosing an irregular white area at lower outer angle of cell; terminal line dark brown, bordered internally by white wedge on anterior third of wing. Underside light brown, darker in apical area; transverse posterior faintly traced. Hindwings light brown above and below, fringe white with darker band near its inner side.

Genitalia as described for the genus.

TYPES.—*M. arizonella*, in the Muséum National d'Histoire Naturelle; *U. incongruella*, in the U.S. National Museum (lectotype), in the American Museum of Natural History (two lectoparatypes).

TYPE DATA.—*M. arizonella*, type not examined, the type locality is given in the original description as Arizona; *U. incongruella*, lectotype male, hereby designated, Argus Mts., April, 91K, USNM 4708, male genitalia slide No. 1121, Carl Heinrich, Feb. 27, 1941 [USNM]; lectoparatypes, two females, Phoenix, Ariz., June 4, June 5, the former with female genitalia on slide No. 3218, Carl Heinrich, June 14, 1946, the latter has the abdomen lost [AMNH]. In his original description Hulst gives the following data: "Argus Mountains, Cal.; taken by Mr. Koebele, in April. Phoenix, Ariz.; taken early in June."

Specimens examined.—83 ♂, 43 ♀.

Distribution (Map 3).

UNITED STATES: Arizona: Coconino Co., Tuba City, 2 ♂, 5 ♀, Aug. 12, 1948 (C. and P. Vaurie) [AMNH]; Maricopa Co., Phoenix, 1 ♀, June 4, 1897, (bears label: "Urula incongruella *Type* Hulst") [USNM]; Phoenix, 2 ♀, Sept. 11, 1904 [USNM]; 1 ♀, Sept. 13, 1904 [USNM]; Pima Co., 30 mi. east of Quijotoa, 1 ♀, Aug. 28–29, 1927 [CU]; Yuma Co., Dome, 1 ♂, July 21, 1924 (E. P. Van Duzee) [USNM]; Indian Wash near Martinez Lake, 1 ♂, 2 ♀, June 12, 1961 (C. A. Toschi) [UCB]; Palomas, 3 ♂, Aug. 8, 1917 [CU]; no locality, 1 ♀, July 1–7 [USNM]; 2 ♀, June 8–15 [USNM].

California: Kern Co., Shafter, 1♂, 1♀, Aug. 17, 1955 (J. Powell) [UCB]; Riverside Co., Coachella, 1♀, May 2, 1918 (J. C. Bradley) [CU]; Indio, 3♂, 7♀, May 1, 1918 (J. C. Bradley) [CU]; Palm Springs, 1♂, May 6, 1921 (Karl B. Coolidge) [USNM]; 1 ♂, Aug. 20, 1955 (A. H. Rindge) [AMNH]; Riverside, 1♂, Sept. 8, 1940 (H. Buckwalter) [CNC]; Thermal, 1♀, June 17, 1956 (M. Wasbauer) [UCB]; San Bernardino Co., 10 mi. north of Earp. 2♂, 1♀, Apr. 22, 1960 (J. R. Powers) [UCB]; Loma Linda, 1♂, Sept. 1–7 [USNM]; Mojave Desert, Yermo, 1♂, Apr. 10, 1936 (J. A. Comstock) [USNM] ;Needles, 33♂, 9♀, Apr. 24, 1950 (E. C. Johnston) [CNC]; Twentynine Palms, 12♂, 2♀, Apr. 20, 1950 (E. C. Johnston) [CNC]; 7♂, Apr. 21, 1950; San Diego Co., 6 mi. east of Banner, 1♀, July 13, 1963 (J. Powell) [UCB]; county unknown, LaPuerta, 1♂, 1♀, July 1911 (Wright and Field) [USNM]; LaPuerta Valley, 3♂, July 11 (George H. Field) [USNM].

New Mexico: Dona Ana Co., Mesquite near Mesilla Park, 1♂, July 12, 1917 [CNC]; 6♂, 1♀ [CU]; Otero Co., Alamogordo, 1♀, May 10, 1950 (E. C. Johnston) [CNC]; 25 mi. west of Tularosa, 1♀, July 1, 1940 (L. J. Lipovsky) [UK].

Synonymical List of Species Considered

North American Peoriinae

Peoria Ragonot
Aurora Ragonot
Statina Ragonot
Calera Ragonot
Altoona Hulst
Cayuga Hulst
Volusia Hulst
Wekiva Hulst
Osceola Hulst
Chipeta Hulst
Trivolusia Dyar
Ollia Dyar

1. longipalpella (Ragonot)
2. bipartitella Ragonot
   roseopennella (Hulst)
3. tetradella (Zeller)
4. opacella (Hulst)
   dichroeella (Ragonot)
   dichroella (Hampson)
5. floridella Shaffer
6. rostrella (Ragonot)
7. gemmatella (Hulst)
   bistriatella (Hulst)
   pamponerella (Dyar)
8. roseotinctella (Ragonot)
   punctilimbella (Ragonot)
   bifasciella (Hampson)
9. johnstoni Shaffer
10. santaritella (Dyar)
11. holoponerella (Dyar)
12. approximella (Walker)
    haematica (Zeller)
    roseatella (Packard)
    cremoricosta (Hampson)
13. luteicostella (Ragonot)
    nodosella (Hulst)
    perlepidella (Hulst)

Anacostia Shaffer

14. tribulella Shaffer

Arivaca Shaffer
The Pimella Group
15. pimella (Dyar)
16. linella Shaffer
The Ostreella Group
17. ostreella (Ragonot)
discostrigella (Dyar)
18. poohella Shaffer
The Albidella Group
19. albidella (Hulst)
20. artella Shaffer
The Albicostella Group
21. albicostella (Grossbeck)
Atascosa Hulst
22. glareosella (Zeller)
bicolorella Hulst
albocostella (Hulst)
Homosassa Hulst
23. ella Hulst
24. platella Shaffer
25. incudella Shaffer
Reynosa Shaffer
26. floscella (Hulst)
Goya Ragonot
27. stictella (Hampson)

Genera Transferred to Phycitinae

Anerastia Hübner
Prinanerastia Hampson
1. lotella Hübner
Coenochroa Ragonot
Petaluma Hulst
Alamosa Hampson
2. californiella Ragonot
inspergella Ragonot
3. illibella (Hulst)
puricostella Ragonot
piperatella (Hampson)
4. bipunctella (Barnes and McDunnough)
Bandera Ragonot
Nasutes Hampson
5. binotella (Zeller)
subluteella Ragonot
6. cupidinella Hulst
conspersella (Ragonot)
venata (Hampson)
7. virginella Dyar
Wakulla Shaffer
8. carneella (Barnes and McDunnough)
Tampa Ragonot
9. dimediatella Ragonot
Barberia Dyar
10. affinitella Dyar
Ragonotia Grote
Ciris Ragonot
Psammia Hampson
11. dotalis (Hulst)
discigerella (Ragonot)
olivella (Hulst)
saganella Hulst
indianella (Dyar)
flavipicta (Hampson)
Martia Ragonot
Urula Hulst
12. arizonella Ragonot
incongruella (Hulst)

Unplaced Genera and Species

Navasota Ragonot

FIGURE 30

Navasota Ragonot, 1887, p. 18; 1889, p. 117. — Hulst, 1890, p. 212. — Smith, 1891, p. 85. — Ragonot, 1901, p. 369. — Hulst, 1902, p. 439. — Barnes and McDunnough, 1917, p. 149. — Hampson, 1918, pp. 65–66. — McDunnough, 1939, p. 36. [Type: *Navasota hebetella* Ragonot, 1887, p. 18. Monobasic. References as given for the genus.]

DESCRIPTION.—The original descriptions of the genus and species are as follows:

Navasota, gen. nov.—Antennae thick, pubescent, a very flattened pad of scales in sinus. Palpi oblique, ascending, 3rd joint horizontal. Fore-wings with ten veins, 10 from stem of 8 and 9, 4 and 5 stemmed, 3 wanting. Hind wings with seven veins, 8 stalked, 4 and 5 on long stem, 3 wanting, 2 before angle.

86. N. hebetella.—16 mill.—Fore-wings reddish-ochreous, paler on inner margin. Costa with a broad whitish streak not reaching the apex and finely streaked with reddish-ochreous. Hind-wings pale yellowish.

TYPE.—In the Muséum National d'Histoire Naturelle.

TYPE DATA.—A specimen label gives: "ex. coll. Bellfr. coll. Riley."

DISCUSSION.—*Navasota* probably belongs in the Peoriinae, but its exact placement is uncertain as the abdomen of the type is lost. The species may belong to *Peoria*, but apparently is not conspecific with any of the 13 species listed in that genus. No type locality is given in the original description, but Hampson (*in* Ragonot, 1901) in a probable reference to the type reports: "Texas. Un ♂, octobre. Coll. Ragonot." All of Belfrage's southwestern material was collected in Texas.

Uinta Hulst

Uinta Hulst, 1888. p. 116. — McDunnough, 1939, p. 35. Type: *Uinta oreadella* Hulst, 1888, p. 116. — Hulst, 1890, p. 221–222 [listed as a crambid]. — McDunnough, 1939, p. 35. — Rindge, 1955, p. 168. [Monobasic.]

DESCRIPTION.—The original descriptions of the genus and species are as follows:

Uinta, n. gen.

Fore wings 9 veins: 4 and 9 wanting, 3 and 5 separate; hind wings 7 veins; 3 and 5 separate, 2 far from angle, 7 and 8 separate to base; labial palpi horizontal, heavy, long; maxillary palpi strong, heavily scaled on end; antennae of ♂ bent above base, pubescent; ocelli present; tongue wanting; legs shorter and more heavy than usual. Type: *oreadella*, Hulst.

U. oreadella, n. sp.

Palpi fuscous gray, as is also the head; thorax blackish gray; abdomen blackish gray, becoming fuscous and yellowish anally, each segment except basal edged narrowly with gray; fore wings dark fuscous, darker at base; basal line not evident; outer line broad, blackish, a marginal broad line also blackish; at base of center of middle field a lengthened black point; hind wings

fuscous, shining, margin darker; beneath even fuscous on all wings, margins darker.—Colorado."

TYPE.—In the American Museum of Natural History.

TYPE DATA.—Texas, June; G. D. Hulst collection, Rutgers.

DISCUSSION.—The species probably belongs to the Crambinae as Hulst (1890) later indicated, but cannot be placed to subfamily with certainty as the hindwings and abdomen have been lost. The locality given on the specimen (Texas) and that published in that original description (Colorado) do not agree.

Tolima cincaidella Dyar

FIGURE 36

Tolima cincaidella Dyar, 1904, pp. 115–116. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 35.

DESCRIPTION.—The original description of the species is as follows:

Fore wings with 11 veins, 2 well before angle of cell, 3 before angle, 4 and 5 very shortly stalked, 8 and 9 stalked, 10 connate with the base of the stalk, 11 from the cell. Hind wings with 7 veins, 2 from the angle of the cell, 3 and 4 long stalked, 5 absent, 8 distinct. Tongue moderate, apparently about twice the length of the head; palpi very long, porrect and drooping; antennae simple, lengthily ciliate.

Pale ocherous whitish, lines paler, obscure, defined by dusky edgings toward the median space. Inner line produced a little on costa, preceded by a very faint, russet patch on the inner margin. Discal dots blackish, separate. Outer line drawn inward subcostally, else even, a slight dentation indicated in the dusky border. The wing is all very pallid. Hind wing whitish, translucent. Expanse 27 mm.

Three specimens, all with the abdomens broken, but apparently males, Rock Spring, Wyoming (T. Kincaid).

Type: No. 7934, U.S. National Museum.

TYPE.—In the U.S. National Museum.

TYPE DATA.—No locality given on specimens, USNM 7934; printed tag bears number "37049." The three specimens bear identical labels.

DISCUSSION.—The species does not belong in the Peoriinae, but otherwise placement to subfamily is uncertain.

Statina gaudiella Hulst

Statina gaudiella Hulst, 1890, pp. 216–217. — Smith, 1891, p. 85. — Ragonot, 1901, pp. 415–416. — Hulst, 1902, p. 440. — Dyar, 1904c, p. 228. — Barnes and McDunnough, 1917, p. 150. — Hampson, 1918, p. 60. — McDunnough, 1939, p. 36. — Rindge, 1955, p. 163.

DESCRIPTION.—The original description of the species is as follows:

2. S. gaudiella n.sp.—Expands 13 mm. Palpi and antennae ochreous fuscous; abdomen ochreous. Fore wings squamose; ground color ochreous, with a faint violet fuscous tinge, this sprinkled with lengthened black scales, much more

thickly about basal line and within outer line forming indeterminate blackish bands; lines indistinct, indeterminate, not evident except by the blackish scaling; costa on outer field darker, with black scales; hind wings yellowish fuscous, darker on veins.

Differs from typical *Statina* in that cells of both wings are very short.

TYPE.—In the American Museum of Natural History.

TYPE DATA.—Central Texas, Blanco County, September, collection G. D. Hulst.

DISCUSSION.—The holotype consists of meso- and metathorax, the right pair of wings, and the left hindwing. On the basis of wing venation *gaudiella* probably belongs in the Peoriinae, but exact placement is impossible owing to the poor condition of the holotype.

Ollia parvella Dyar

Ollia parvella Dyar, 1906, p. 31. — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 36. — Kimball, 1965, p. 250.

DESCRIPTION.—The original description of the species is as follows:

Costal half of fore wing white with slight darker lines on the veing toward apex. Inner half pale ocherous, shading to gray next to white part. Hind wing whitish. Expanse, 12 mm.

Six ♀, Brownsville, Tex., May 31 to June 9, 1904 (H. S. Barber).

TYPE.—In the U.S. National Museum.

TYPE DATA.—Holotype: Texas, Brownsville, female, June 3?, 1904; H. S. Barber; USNM 9103; female genitalia slide No. 10, Carl Heinrich, Dec. 20, 1932.

DISCUSSION.—In the absence of male specimens placement is uncertain. The species probably belongs in the Phycitinae and may require a new genus when males can be examined. *Ollia* is a synonym of *Peoria*.

Altoona ardiferella Hulst, *Aurora nigromaculella* Hulst, and *Parramatta placidella* Barnes and McDunnough

These three names belong in the Phycitinae and should probably be referred to *Laetilia* Ragonot, but placement within the subfamily should await a thorough study of *Laetilia* and allied genera.

Altoona ardiferella Hulst

Altoona ardiferella Hulst, 1888, p. 116; 1890, p. 208. — Smith, 1891, p. 84. — Barnes and McDunnough, 1918, p. 176. — Rindge, 1955, p. 157.
Zophodia ardiferella (Hulst). — Ragonot, 1889, p. 116.
Tolima ardiferella (Hulst). — Ragonot, 1901, pp. 506–507.
Saluria ardiferella Hulst, 1902, p. 439. — Hampson, 1918, p. 99.
Pectinigera [sic] *ardiferella* (Hulst). — Dyar, 1904b, p. 159.
Pectinigeria ardiferella (Hulst). — Barnes and McDunnough, 1917, p. 149. — McDunnough, 1939, p. 35.

TYPE.—Possibly lost. A badly damaged specimen in the American Museum of Natural History bears a Hulst type label and "Col., July, Collection G D Hulst," female genitalia slide No. 3229, Carl Heinrich, June 14, 1946. The original description gives the type locality as Texas. See discussion by Barnes and McDunnough (1918).

HOST.—Dyar (1904b) reports specimens bred from *Orthezia annae* (Coccidae) on *Atriplex canescens* (Chenopodiaceae).

Aurora nigromaculella Hulst

Aurora nigromaculella Hulst, 1900 1901, 224: 1902, p. 438. — Rindge, 1955, p. 167.
Zohpodia nigromaculella (Hulst). — Dyar, 1904c, p. 228.
Saluria nigromaculella (Hulst). — Hampson, 1918, p. 100.

TYPE.—Holotype, in the U.S. National Museum.

TYPE DATA.—Arizona, Santa Rita Mts., June 8, 1898, E. A. Schwarz; USNM 5185; female genitalia slide 2269, Carl Heinrich, Sept. 11, 1934. A specimen in the American Museum of Natural History bears a cotype label and "Hot Springs, N. Mex. 7000 ft. alt. Sept., Collection G D Hulst"; abdomen lost. The original description mentions only the Arizona specimen.

DISCUSSION.—Dyar (1904b) and McDunnough (1939) consider this to be a synonym of *ardiferella* Hulst.

Parramatta placidella Barnes and McDunnough

Parramatta placidella Barnes and McDunnough, 1918, p. 177, pl. 24, fig. 17. — McDunnough, 1939, p. 35.

TYPES.—In the U.S. National Museum.

TYPE DATA.—Lectotype, hereby designated, male, Olancha, Inyo County, Calif., June 24–30, Barnes collection, male genitalia slide No. 1127, Carl Heinrich, Feb. 6, 1942: labeled "*Parramatta placidella* Type B & McD."

Lectoparatypes: Olancha, Inyo County, Calif., four females, all labeled "*Parramatta placidella* Paratype B & McD," Barnes collection; three specimens dated June 8–15, the fourth dated June 16–23 and labeled female genitalia slide No. 1128, Carl Heinrich, Feb. 6, 1942.

On all five specimens Inyo is misspelled on the label as "Inya."

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Explanation of Figures

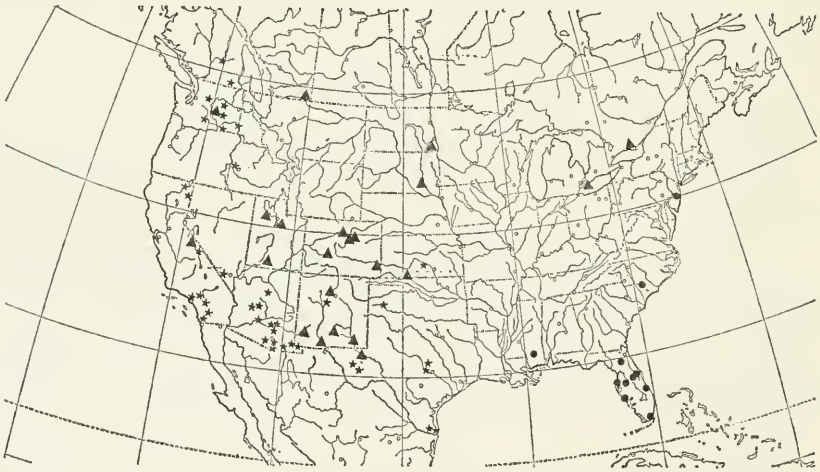
The figures have not been reproduced to any fixed scale, and in general smaller specimens are presented in greater enlargement than larger ones.

Components of the male genitalia are enlarged to the same degree for each species unless otherwise indicated. Sketches of the aedeagus, gnathos, or transtilla have been added in addition to or in place of photographs where these did not render the structures with sufficient clarity. Male genitalia of Coenochroa, Martia, Ragonotia, and all of the Peoriinae have been dissected, opened, and flattened as described on page 3.

Female genitalia of the Peoriinae are illustrated in lateral view, those of phycitine specimens in dorsal view.

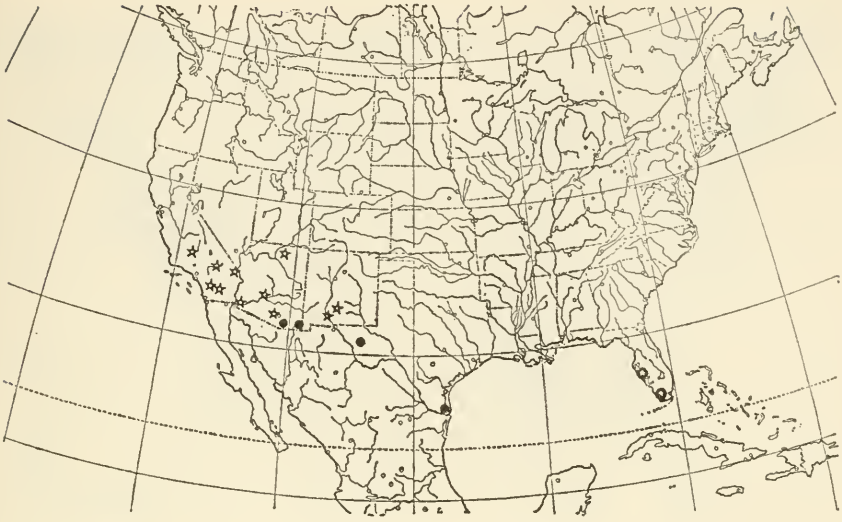
MAP 1.—Distribution of species

☆*Anerastia lotella*
○*Ragonotia dotalis*
●*Tampa dimediatella*



MAP 2.—Distribution of *Coenochroa* species

★*C. californiella*
▲*C. illibella*
●*C. bipunctella*



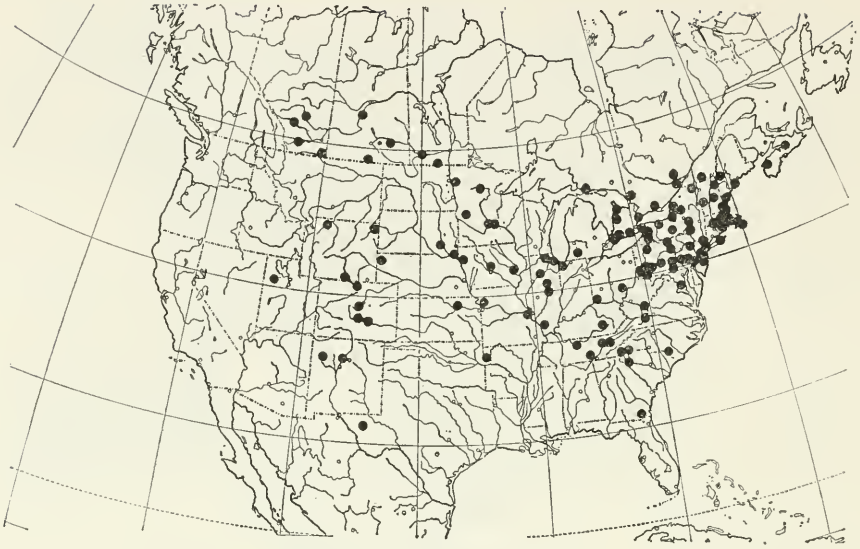
MAP 3.—Distribution of species

●*Barberia affinitella*
Wakulla carneella [1]
☆*Martia arizonella*

MAP 4.—Distribution of species

☆*Bandera binotella*
B. virginella [1]
▲*Goya stictella*
●*B. cupidinella*
★*Anacostia tribulella*

[1] Open five-pointed star within black circle.

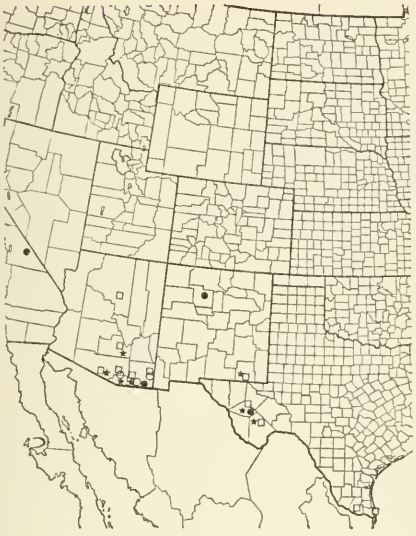


MAP 5.—Distribution of *Peoria approximella*

MAP 6.—Distribution of *Peoria* species

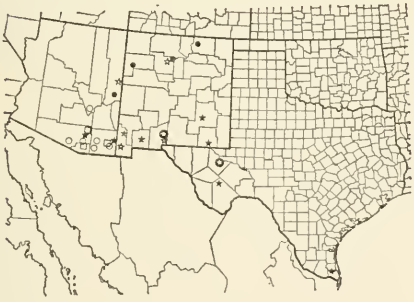
★*P. gemmatella*
P. rostrella [1]
○*P. roseotinctella*
☆*P. tetradella*

[1] Open five-pointed star within black circle.



MAP 7.—Distribution of *Peoria* species
●*P. holoponerella* ★*P. johnstoni*
□*P. opacella* ○*P. santaritella*

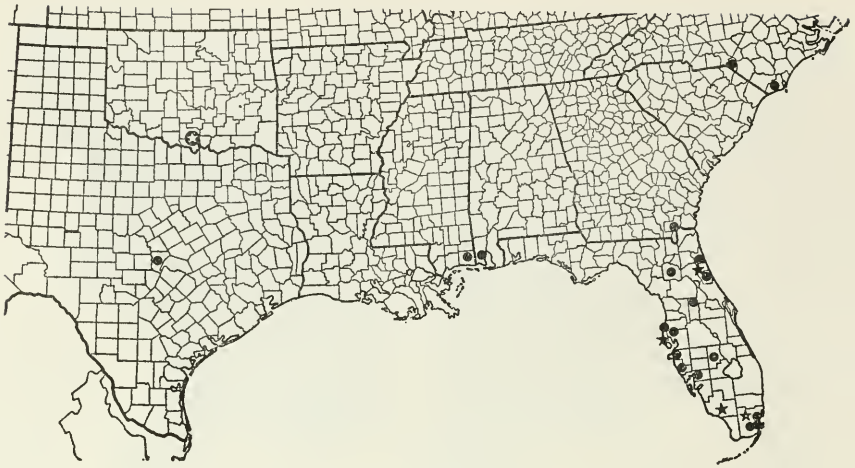
MAP 8.—Distribution of *Peoria* species
●*P. bipartitella* *P. longipalpella* [1]



MAP 9.—Distribution of *Arivaca* species
A. albidella [1] ☆*A. artella*
□*A. poohella* ●*A. linella*
★*A. ostreella* ○*A. pimella*

[1] Open five-pointed star within black circle.

MAP 10.—Distribution of species
□*Peoria floridella* ●*P. luteicostella*
★*Arivaca albicostella*



MAP 11.—Distribution of *Homosassa* species

●*H. ella* *H. incudella* [1]

★*H. platella*

MAP 12.—Distribution of species

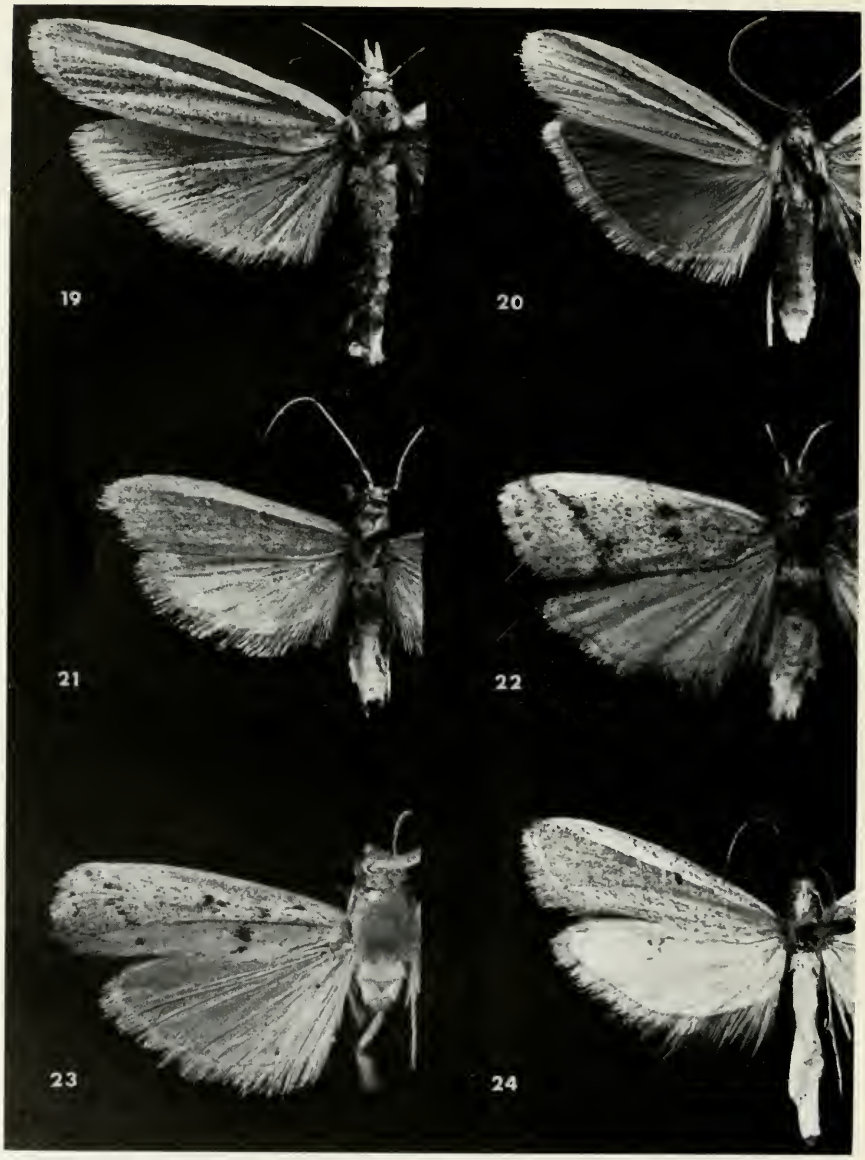
●*Atascosa glareosella* *Reynosa floscella* [1]

[1] Open five-pointed star within black circle.

FIGURES 1–6.—Wing Expanse of Adults: 1, *Peoria johnstoni*, 19mm; 2, *P. rostrella*, holotype, approximately 24 mm; 3, *P. holoponerella*, 24 mm; 4, *P. holoponerella*, 28 mm; 5, *P. santaritella*, 25 mm; 6, *P. tetradella*, approximately 24 mm.

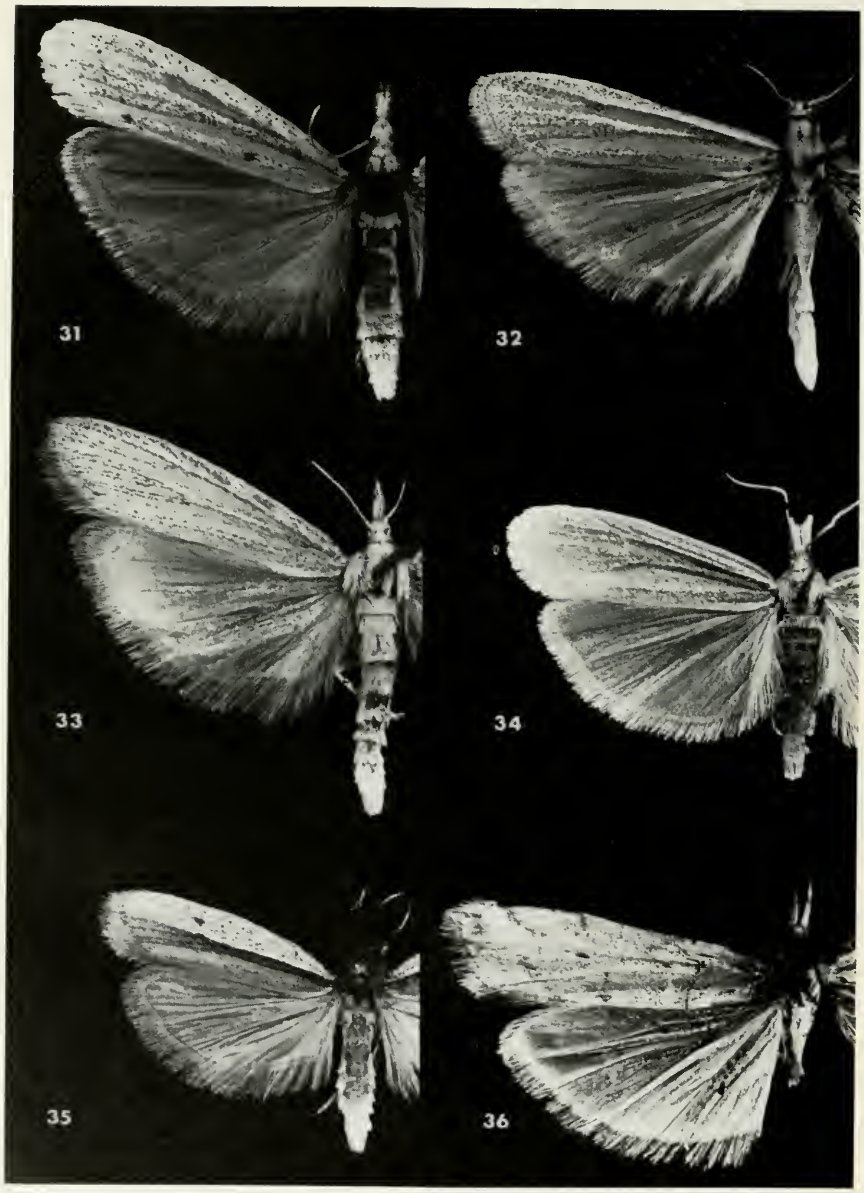
FIGURES 7–12.—Wing Expanse of Adults: 7, *Peoria gemmatella*, 26 mm; 8, *P. floridella*, holotype, 26 mm; 9, *P. longipalpella*, 23 mm; 10, *P. roseotinctella*, 19 mm; 11, *P. opacella*, 23 mm; 12, *P. luteicostella*, 22 mm.

FIGURES 13–18.—Wing Expanse of Adults: 13, *Peoria bipartitella*, 17 mm; 14, *P. approximella*, 19 mm; 15, *Arivaca pimella*, holotype, 25 mm; 16, *A. linella*, 25 mm; 17, *A. albidella*, 24 mm; 18, *A. artella*, 25 mm.

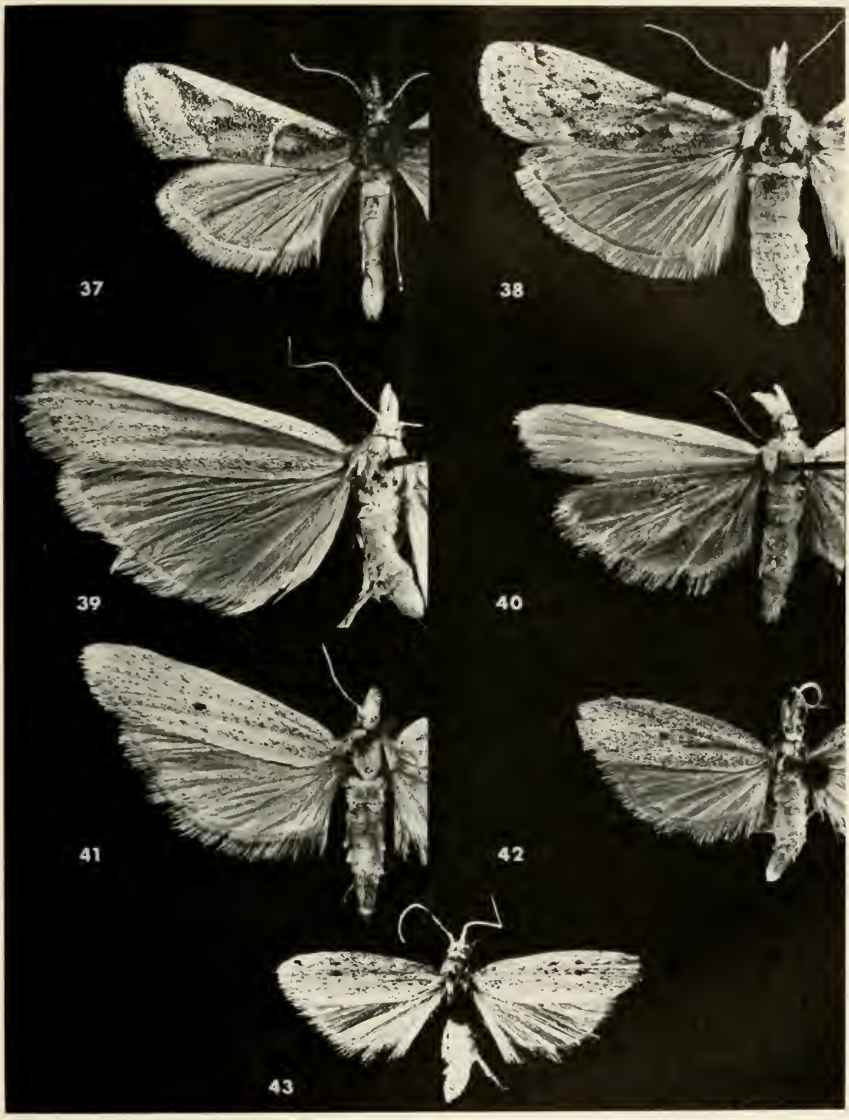


FIGURES 19–24.—Wing Expanse of Adults: 19, *Arivaca ostreella*, 28 mm; 20, *A. poohella*, holotype, 27 mm; 21, *A. albicostella*, 18 mm; 22, *Reynosa floscella*, 13 mm; 23, *Goya stictella*, 17 mm; 24, *Barberia affinitella*, 14 mm.

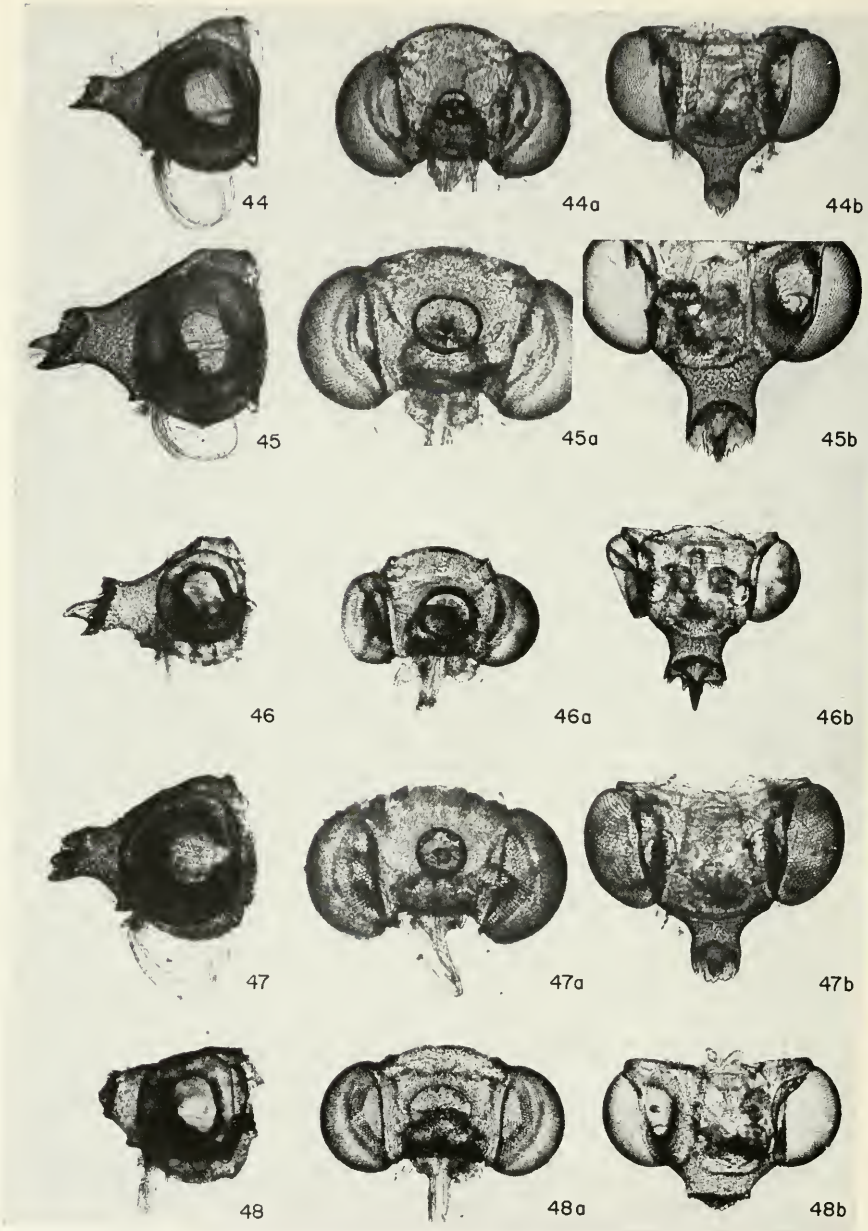
FIGURES 25–30.—Wing Expanse of Adults: 25, *Anacostia tribulella*, holotype, 23 mm; 26, *A. glareosella*, 22 mm; 27, *Homosassa ella*, 17 mm; 28, *H. platella*, holotype, 17 mm; 29, *H. incudella*, paratype, 21 mm; 30, *Navasota herbetella*, holotype, approximately 16 mm.



FIGURES 31–36.—Wing Expanse of Adults: 31, *Bandera binotella*, 23 mm; 32, *B. cupidinella* 22 mm; 33, *B. virginella*, 24 mm; 34, *Anerastia lotella*, 29 mm; 35, *Tampa dimediatella*, 17 mm; 36, *Tolima cincaidella*, holotype, 28 mm.

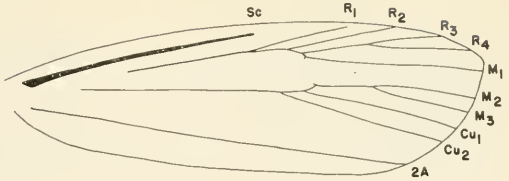


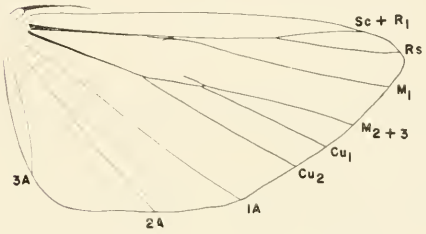
FIGURES 37–43.—Wing Expanse of Adults: 37, *Martia arizonella*, 17 mm; 38, *Ragonotia dotalis*, 29 mm; 39, *Coenochroa illibella*, 30 mm; 40, *C. illibella*, 22 mm; 41, *C. californiella*, 20 mm; 42, *C. bipunctella*, 18 mm; 43, *Wakulla carneella*, holotype, approximately 11 mm.



FIGURES 44–48.—Adult crania: 44–48, lateral view; 44*a*–48*a*, anterior view; 44*b*–48*b*, dorsal view. 44–44*b*, *Coenochroa californiella;* 45–45*b*, *C. illibella,* typical; 46–46*b*, *C. illibella,* specimen from series taken at Pecos, Tex.; 47–47*b*, *C. bipunctella;* 48–48*b*, *Anerastia lotella.*

49





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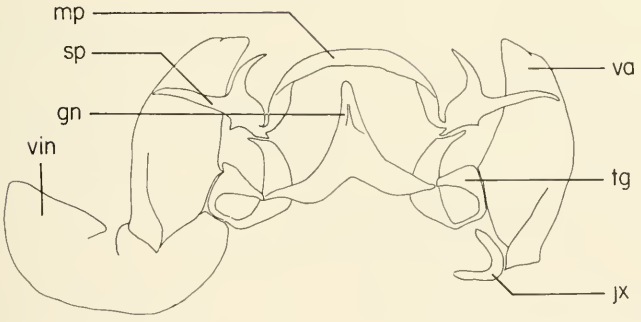
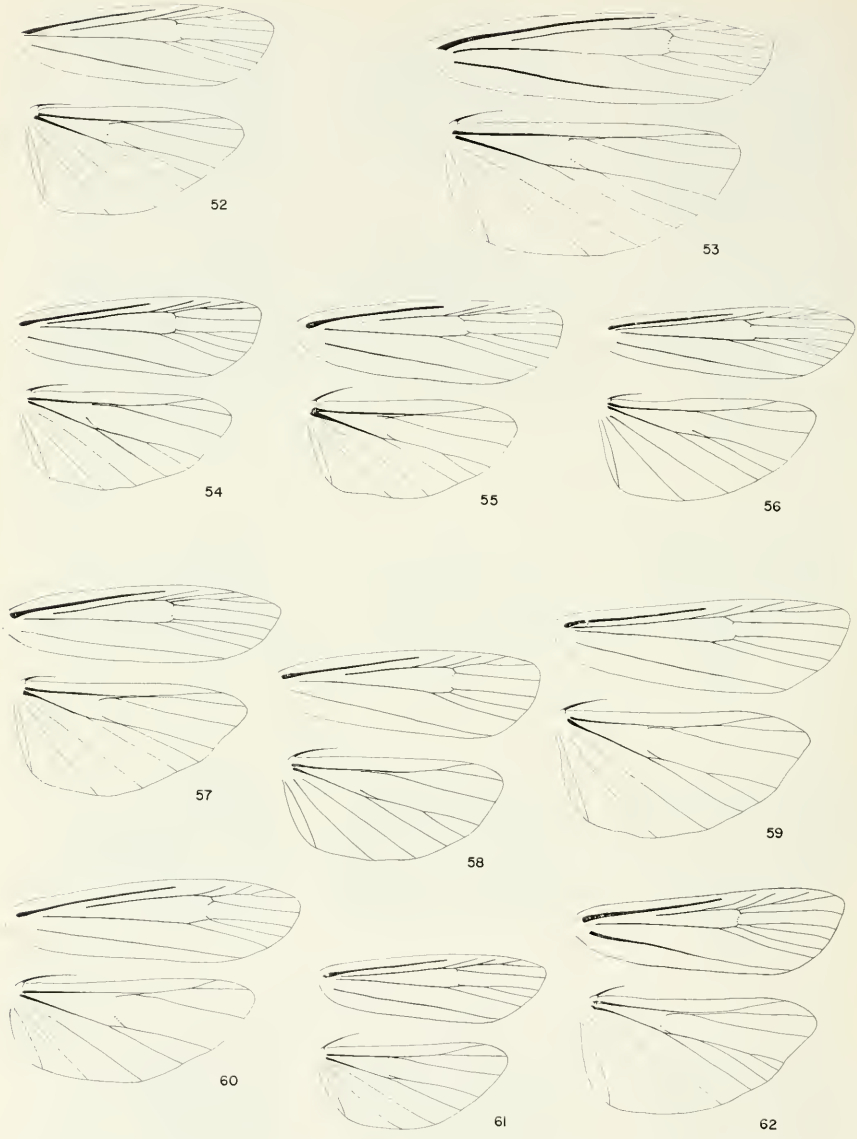
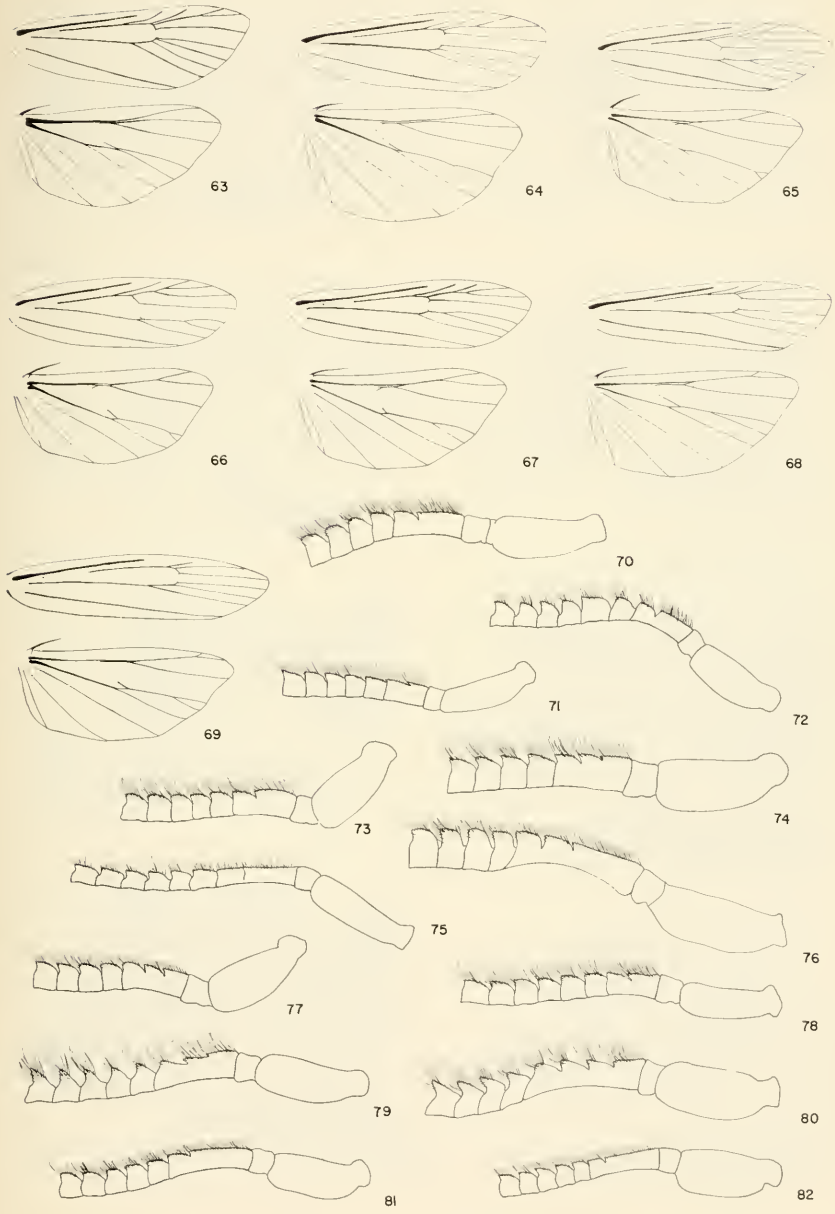


51

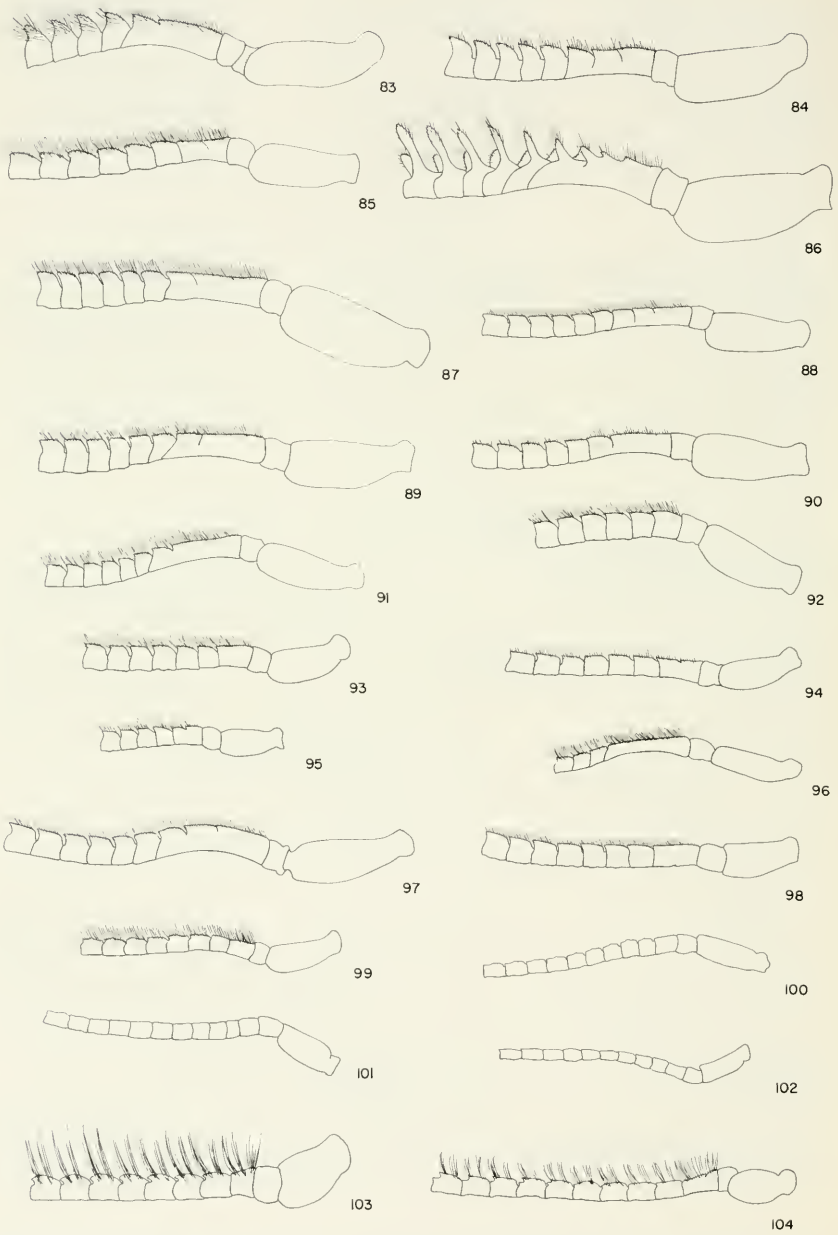
FIGURES 49–51.—49, *Martia arizonella*, dorsal view of adult cranium; 50, *Arivaca pimella*, wing venation; 51, *Peoria longipalpella*, flattened male genitalia. jx=juxta, sp=spicate process of uncus, tg=tegumen, mp=medial process of uncus, gn=gnathos, va=valva, vin=vinculum.



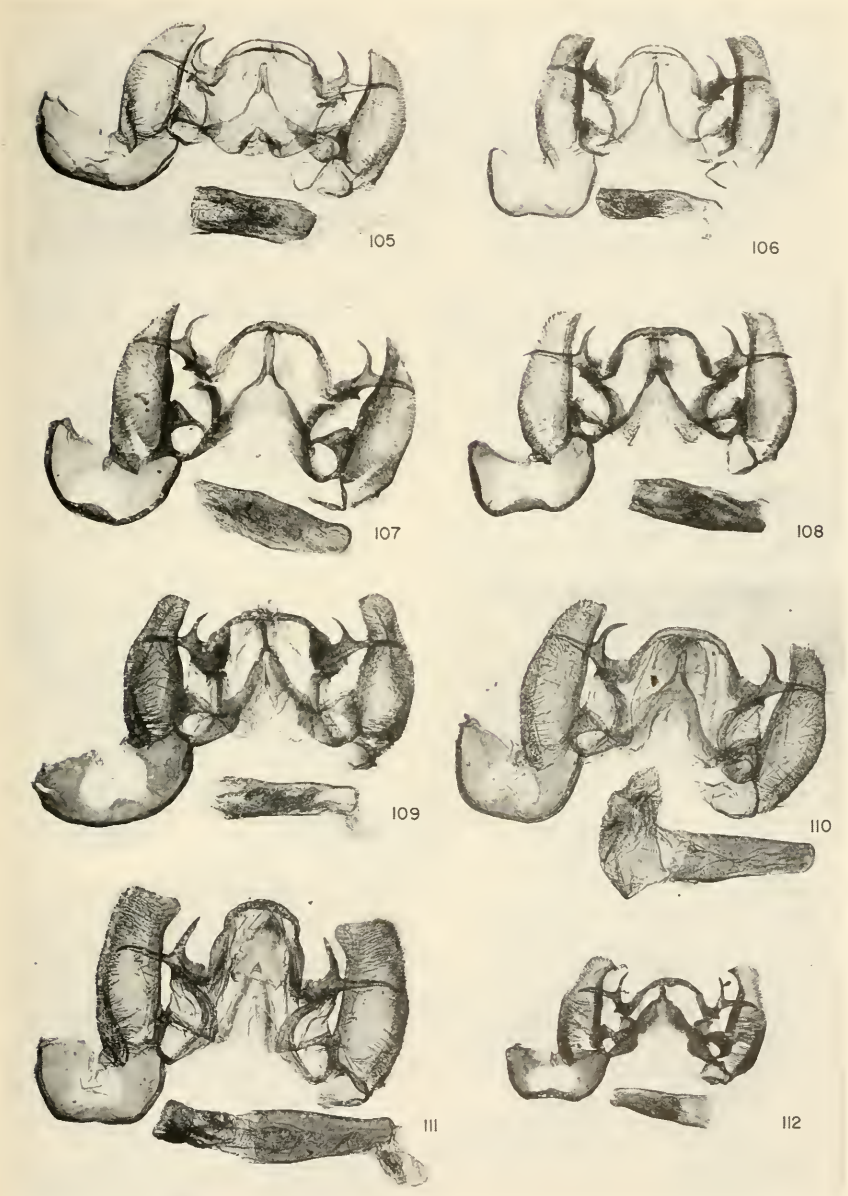
FIGURES 52–62.—Wing venation: 52, *Arivaca pimella;* 53, *A. ostreella;* 54, *Atascosa glareosella;* 55, *Peoria floridella;* 56, *Arivaca linella;* 57, *A. poohella;* 58, *Homosassa ella;* 59, *Peoria approximella;* 60, *Arivaca albicostella;* 61, *Peoria roseotinctella;* 62, *Ragonotia dotalis.*



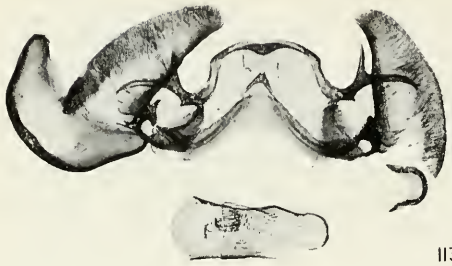
FIGURES 63–82.—Wing venation and male antennae: 63, *Martia arizonella;* 64, *Anerastia lotella;* 65, *Coenochroa californiella;* 66, *C. bipunctella;* 67, *C. illibella;* 68, *Bandera binotella;* 69, *Tampa dimediatella;* 70, *Peoria longipalpella;* 71, *P. bipartitella;* 72, *P. tetradella;* 73, *P. opacella;* 74, *P. floridella;* 75, *P. rostrella;* 76, *P. gemmatella;* 77, *P. roseotinctella;* 78, *P. johnstoni;* 79, *P. santaritella;* 80, *P. holoponerella;* 81, *P. approximella;* 82, *P. luteicostella.*



FIGURES 83–104.—Male antennae: 83, *Anacostia tribulella;* 84, *Arivaca pimella;* 85, *A. linella;* 86, *A. ostreella;* 87, *A. poohella;* 88, *A. albidella;* 89, *A. artella;* 90, *A. albicostella;* 91, *Atascosa glareosella;* 92, *Homosassa ella;* 93, *H. platella;* 94, *H. incudella,* holotype; 95, *Reynosa floscella;* 96, *Goya stictella;* 97, *Anerastia lotella;* 98, *Coenochroa californiella;* 99, *Bandera binotella;* 100, *Wakulla carneella;* 101, *Tampa dimediatella;* 102, *Barberia affinitella;* 103, *Ragonotia dotalis;* 104, *Martia arizonella.*



FIGURES 105–112.—Male genitalia: 105, *Peoria longipalpella;* 106, *P. bipartitella;* 107, *P. tetradella;* 108, *P. opacella;* 109, *P. floridella*, holotype; 110, *P. rostrella*, vesica everted; 111, *P. gemmatella*, vesica everted; 112, *P. roseotinctella.*



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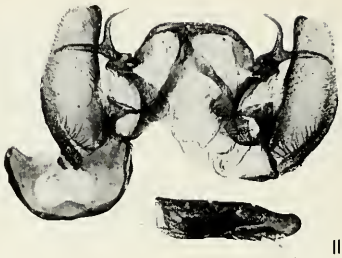

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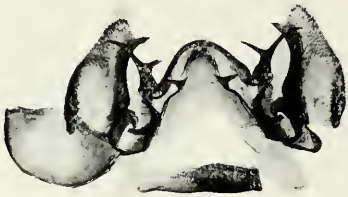

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FIGURES 113–120.—Male genitalia: 113, *Peoria johnstoni;* 114, *P. santaritella;* 115, *P. holoponerella,* vesica everted; 116, *P. approximella;* 117, *P. luteicostella;* 118, *Anacostia tribulella,* paratype; 119, *Arivaca pimella;* 120, *A. linella.*

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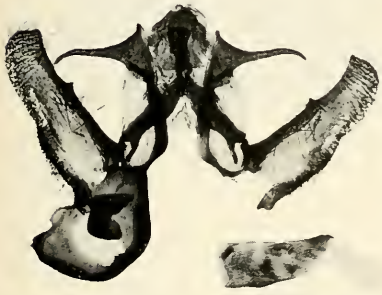

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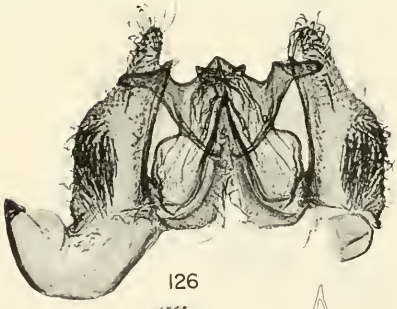

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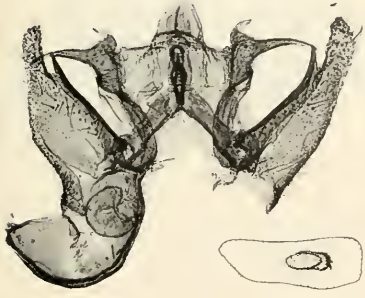
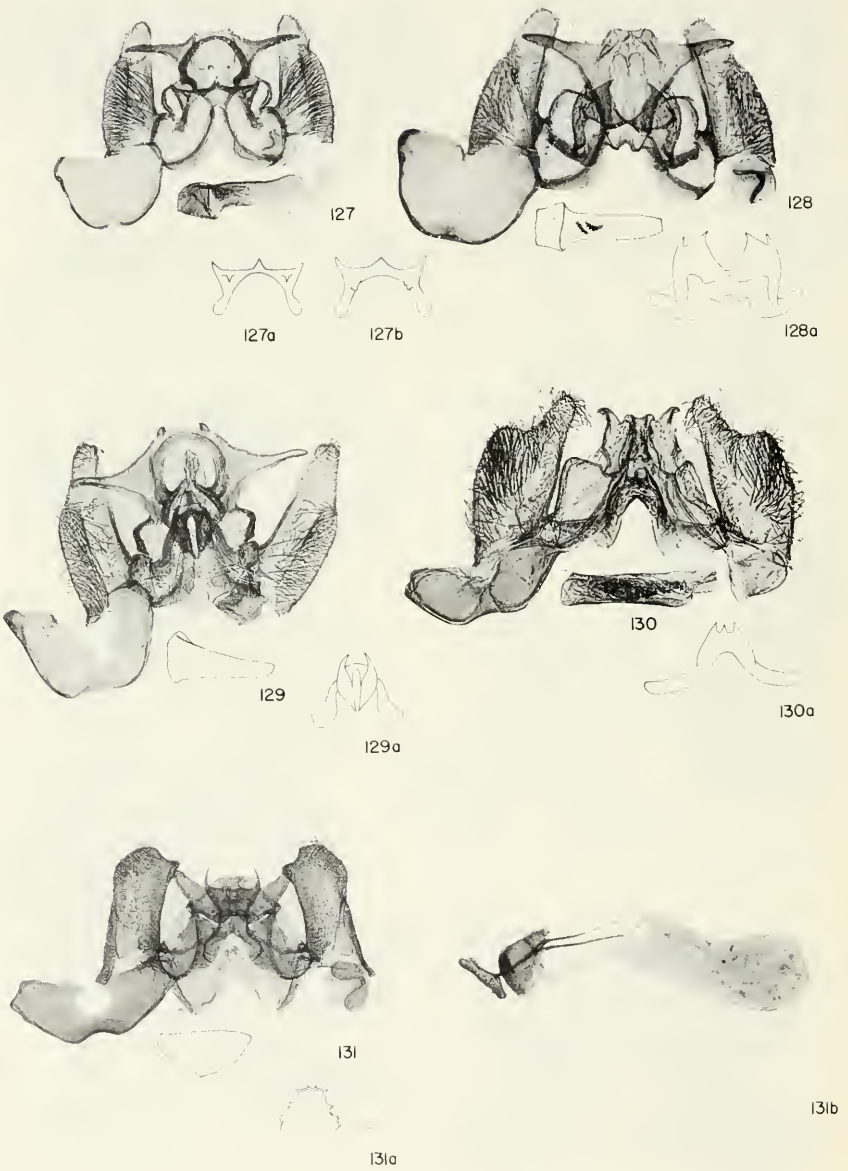
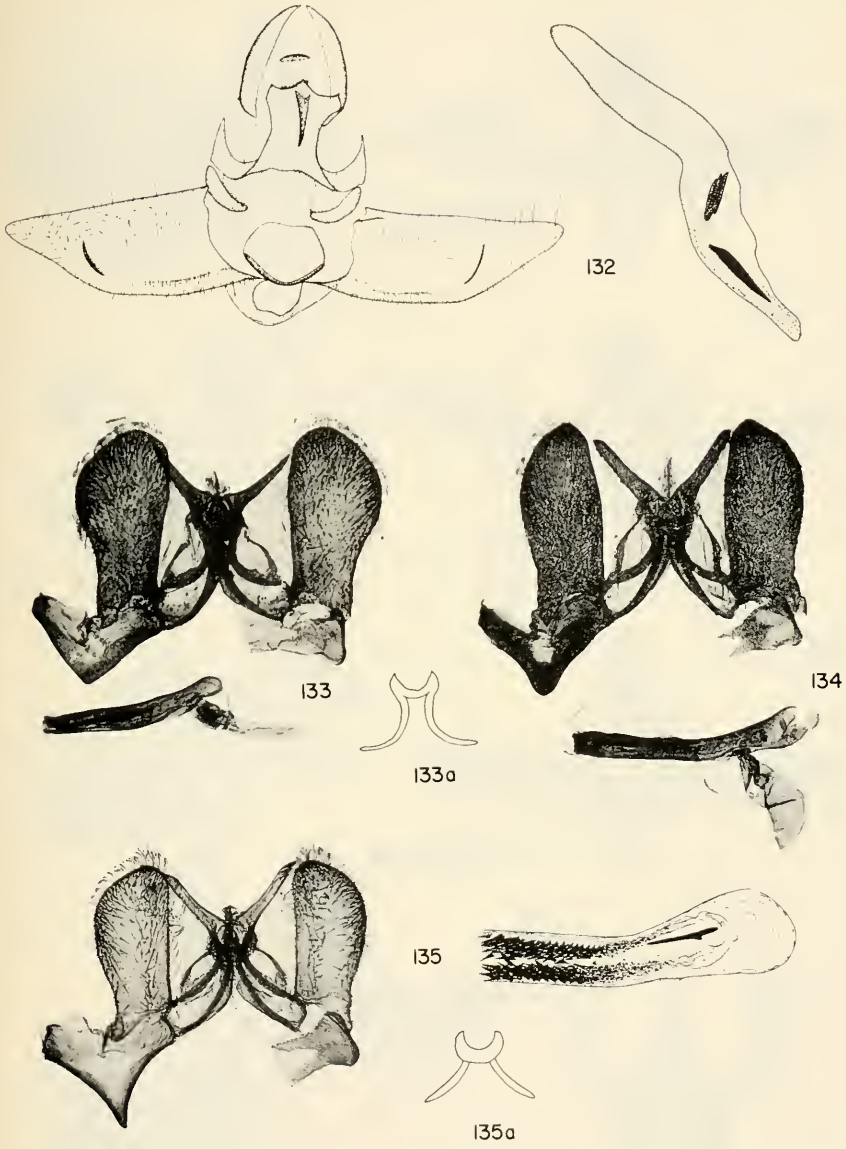


125

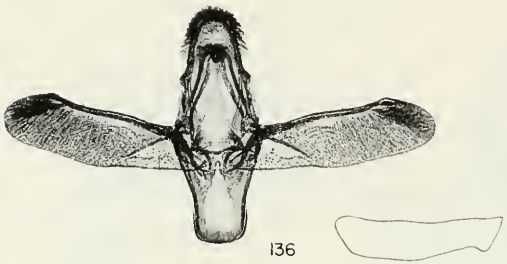
FIGURES 121–126.—Male genitalia: 121, *Arivaca ostreella*, vesica everted; 122, *A. poohella*, paratype, vesica everted; 123, *A. albidella;* 124, *A. artella*, paratype; 125, *A. albicostella;* 126, *Atascosa glareosella;* 126*a*, gnathos.

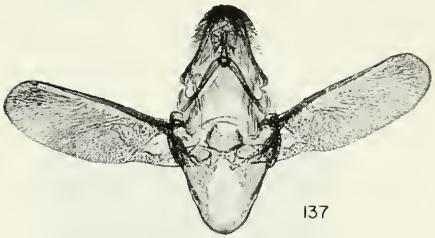


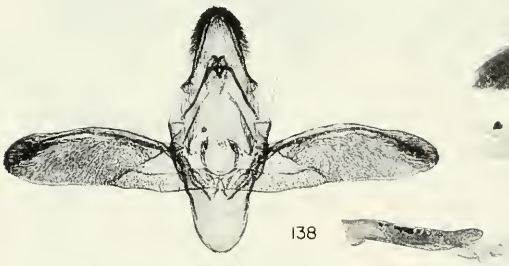
FIGURES 127–131.—Genitalia: 127, *Homosassa ella*, male; 127*a*, gnathos; 127*b*, gnathos similar to that of lectotype; 128, *H. platella*, paratype male; 128*a*, gnathos; 129, *H. incudella*, holotype male; 129*a*, gnathos; 130, *Reynosa floscella*, male; 130*a*, gnathos; 131, *Goya stictella*, male; 131*a*, transtilla; 131*b*, female genitalia.



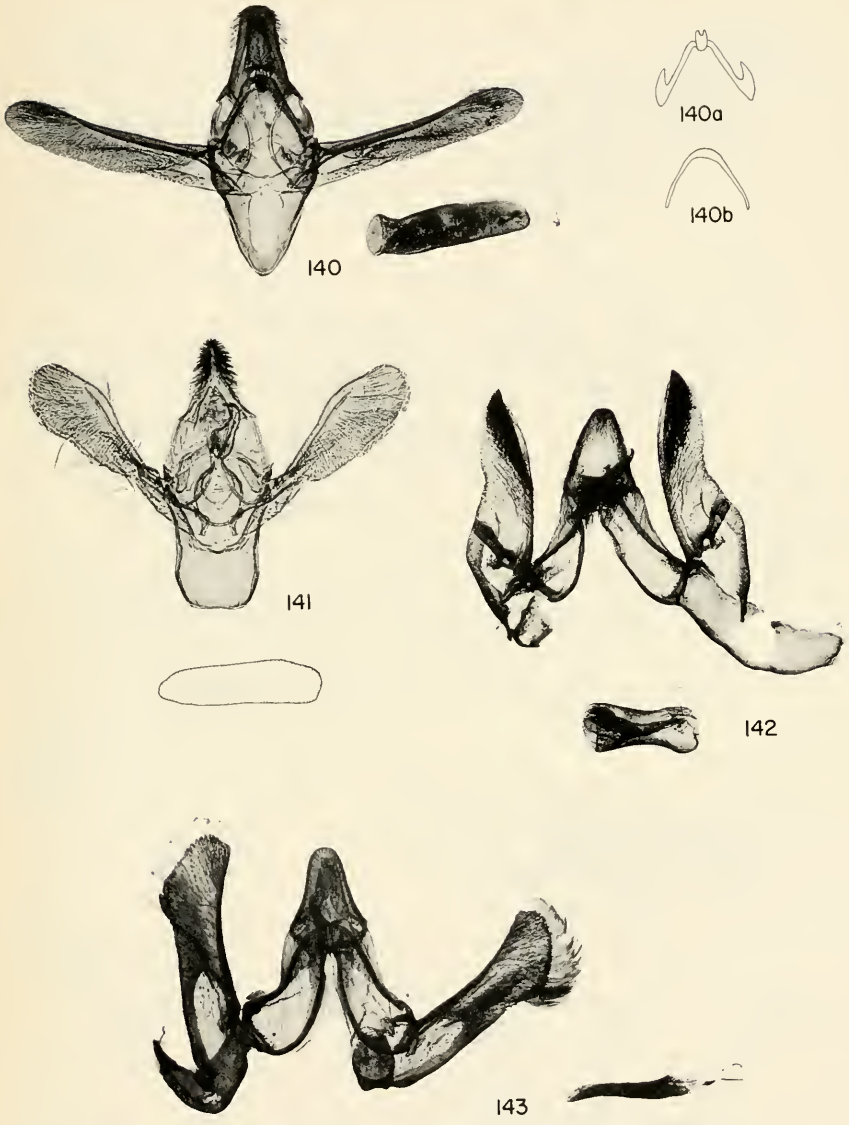
FIGURES 132–135.—Male genitalia: 132, *Anerastia lotella*, vesica everted; 133, *Coenochroa californiella;* 133*a*, gnathos; 134, *C. illibella;* 135, *C. bipunctella;* 135*a*, gnathos.



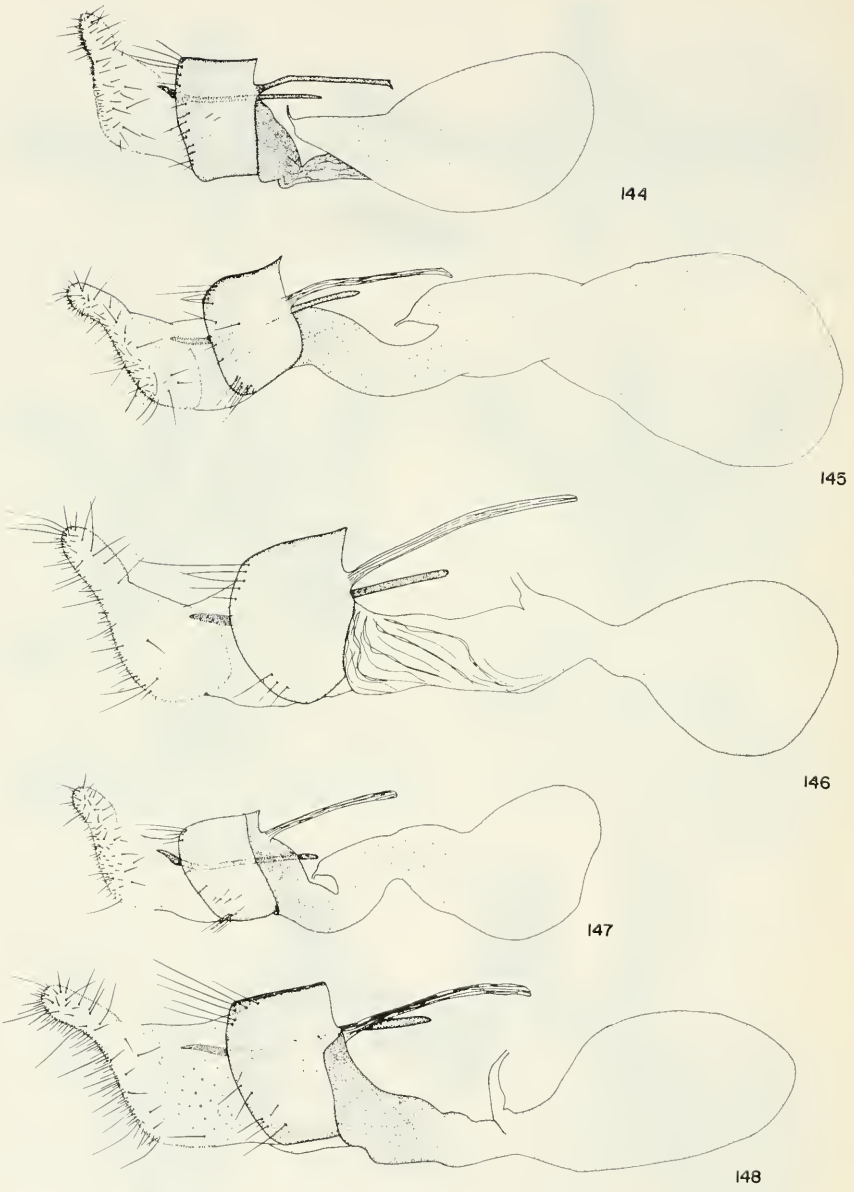




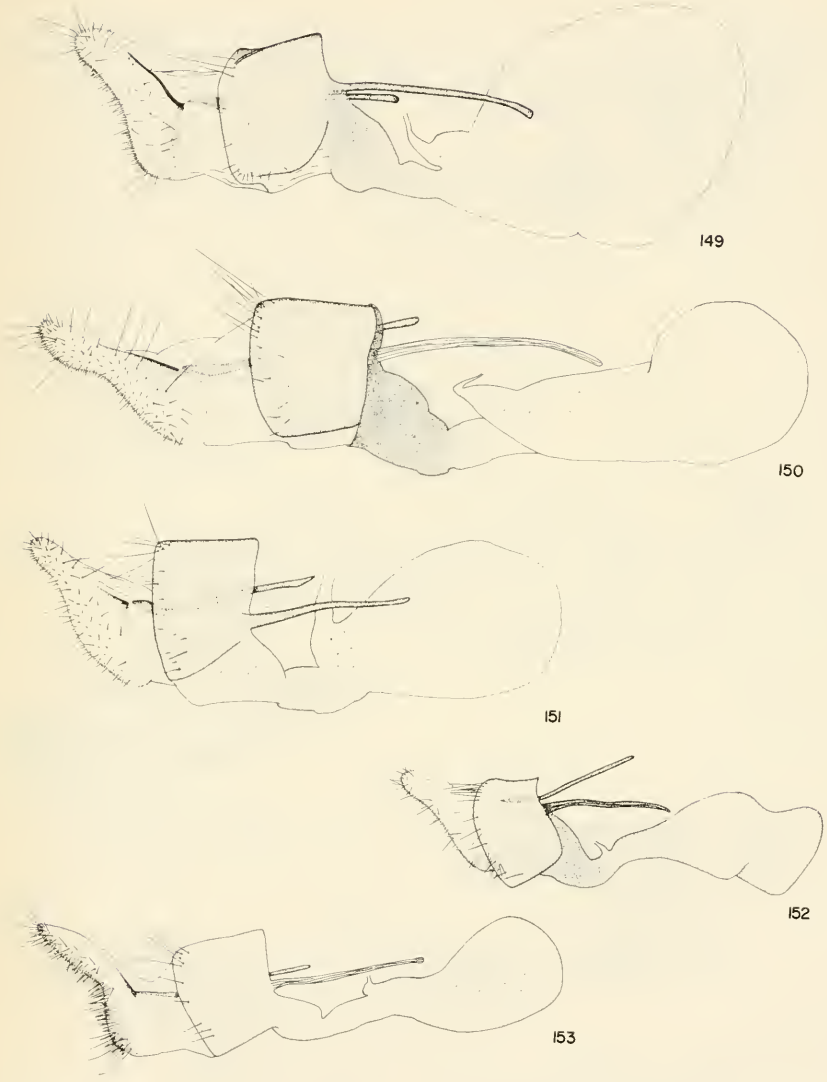
FIGURES 136–139.—Male genitalia: 136, *B. binotella;* 136*a*, tufts and sclerotizations of 8th abdominal segment; 137, *B. cupidinella;* 137*a*, sclerotizations of 8th abdom. seg.; 138, *B. virginella;* 138*a*, tufts and sclerotizations of 8th abdom. seg.; 139, *Wakulla carneella;* 139*a*, gnathos; 139*b*, elements of transtilla; 139*c*, tufts and sclerotizations of 8th abdom. seg.



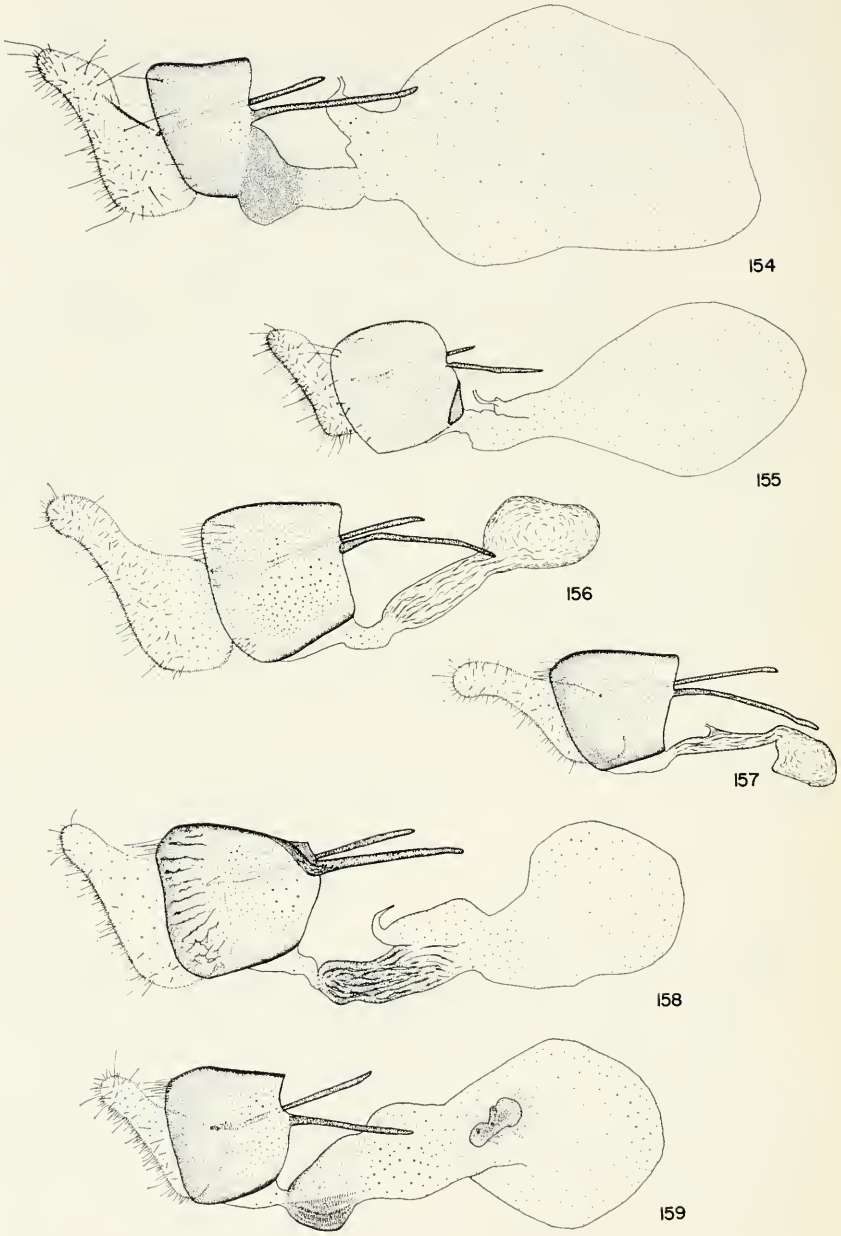
FIGURES 140–143.—Male genitalia: 140, *Tampa dimediatella;* 140*a*, gnathos; 140*b*, transtilla; 141, *Barberia affinitella;* 142, *Ragonotia dotalis;* 143, *Martia arizonella.*



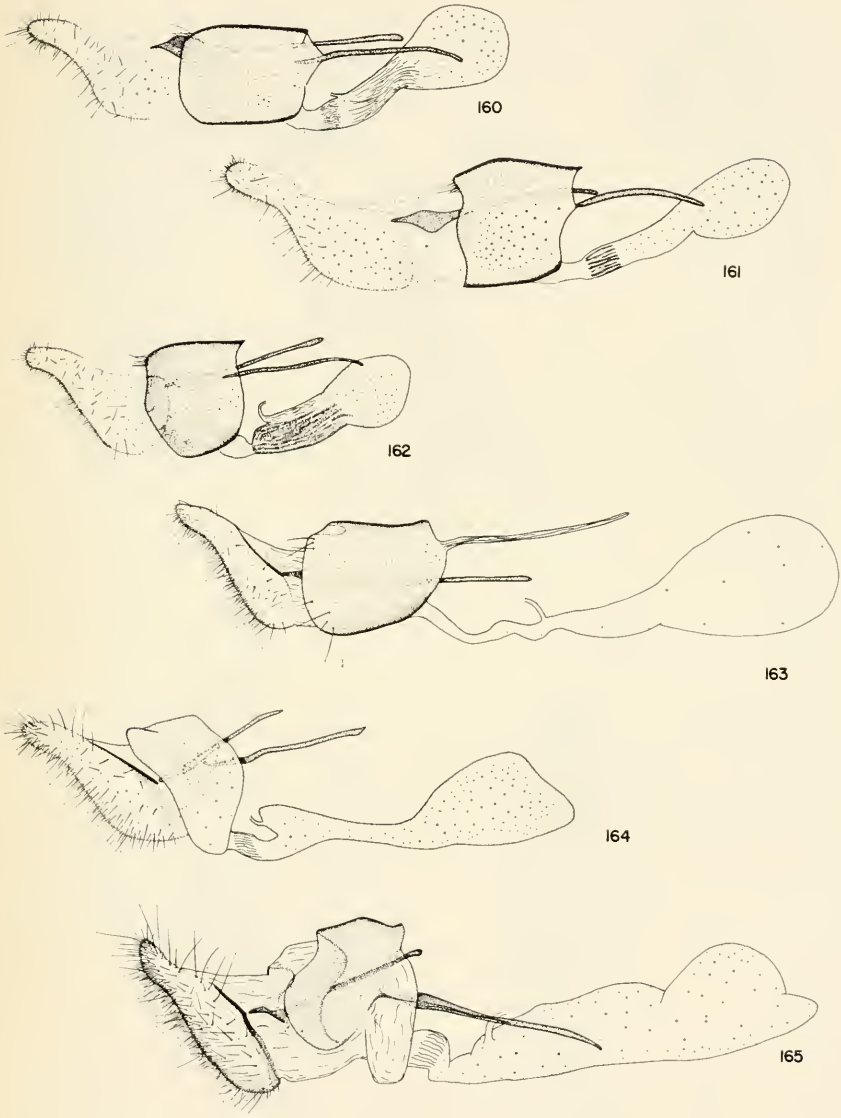
FIGURES 144–148.—Female genitalia: 144, *Peoria longipalpella;* 145, *P. bipartitella;* 146, *P. tetradella;* 147, *P. opacella;* 148, *P. rostrella.*



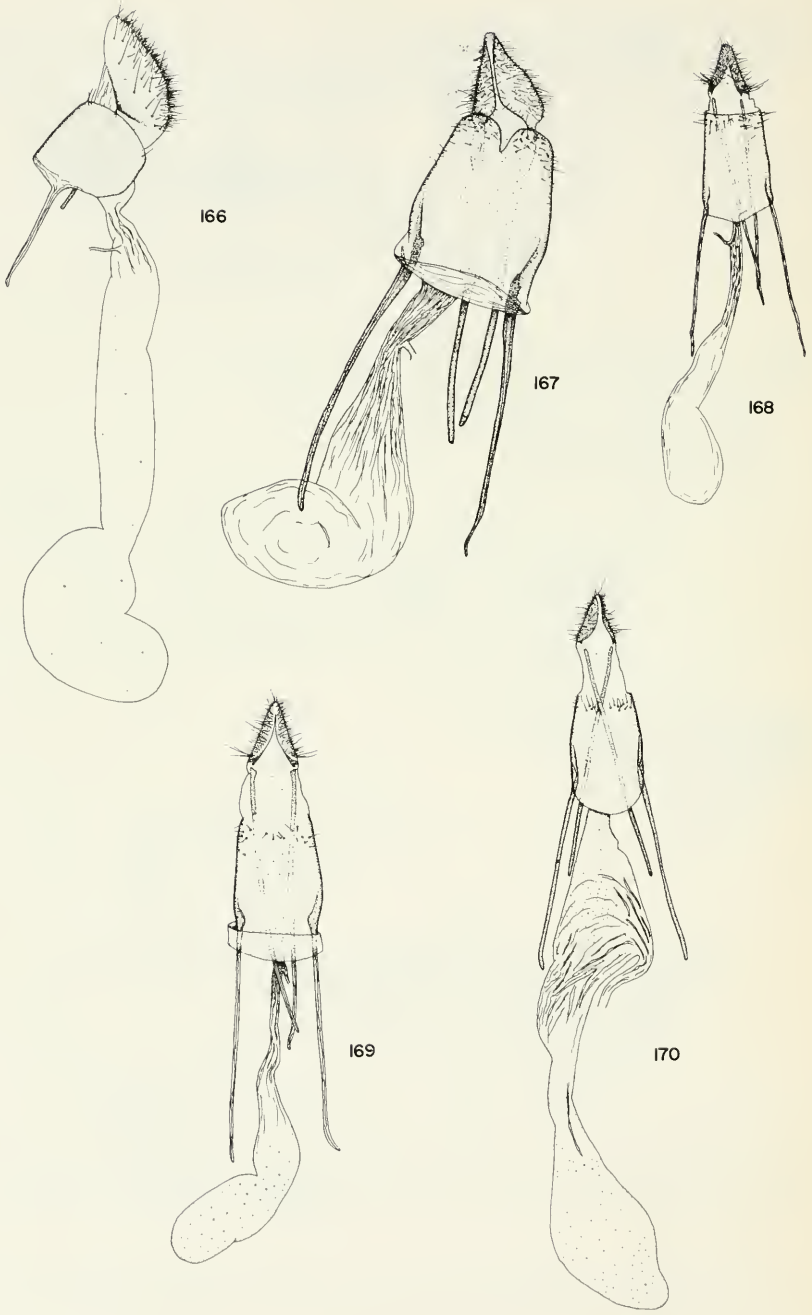
FIGURES 149–153.—Female genitalia: 149, *Peoria gemmatella;* 150, *P. roseotinctella;* 151, *P. johnstoni;* 152, *P. santaritella;* 153, *P. holoponerella.*



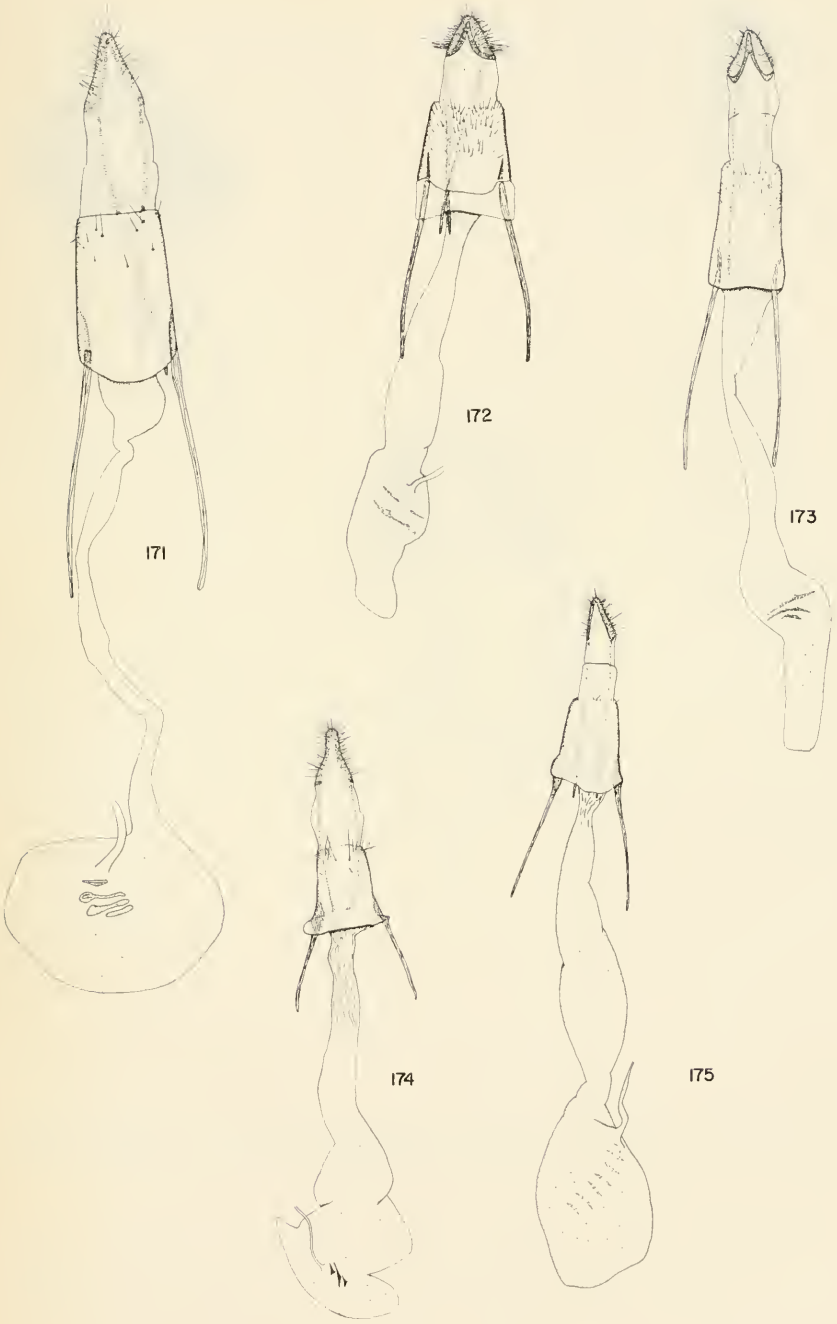
FIGURES 154–159.—Female genitalia: 154, *Peoria approximella;* 155, *P. luteicostella;* 156 *Arivaca pimella;* 157, *A. linella;* 158, *A. ostreella;* 159, *A. poohella.*



FIGURES 160–165.—Female genitalia: 160, *Arivaca albidella;* 161, *A. artella;* 162, *A. albicostella;* 163, *Atascosa glareosella;* 164, *Homosassa ella;* 165, *H. incudella*, paratype.

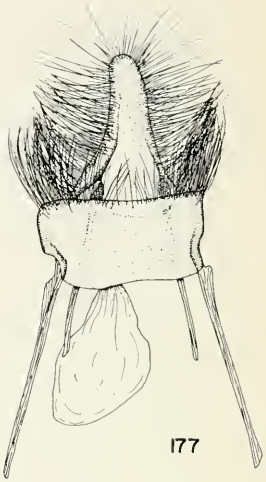


FIGURES 166–170.—Female genitalia: 166, *Reynosa floscella;* 167, *Anerastia lotella;* 168, *Coenochroa californiella;* 169, *C. illibella;* 170, *C. bipunctella.*



FIGURES 171–175.—Female genitalia: 171, *Bandera binotella;* 172, *B. cupidinella;* 173, *B. virginella;* 174, *Wakulla carneella;* 175, *Tampa dimediatella.*

176



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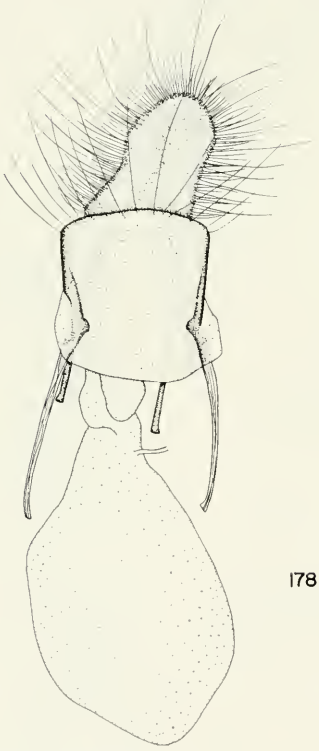

178

FIGURES 176–178.—Female genitalia: 176, *Barberia affinitella;* 177, *Ragonotia dotalis;* 178, *Martia arizonella.*

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